유기물질 분진에 의한 환경성 폐질환: 과민성 폐렴

APR. 13. 2024

울산의대 서울아산병원
송진우

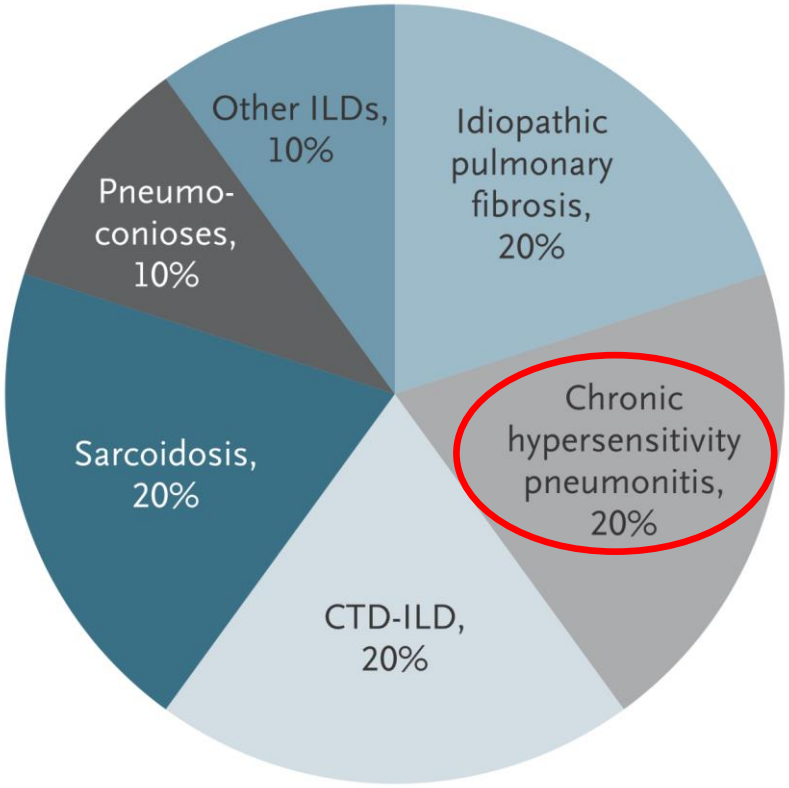
Hypersensitivity pneumonitis

- An inflammatory and/or fibrotic disease affecting the lung **parenchyma** and **small airways**.
- Typically results from an **immune-mediated** reaction provoked by an overt or occult **inhaled antigen** in **susceptible** individuals.
- Fungal and bacterial; “moldy” hay, animal proteins, polysaccharides or chemicals (isocyanate)

Raghu G, et al. *Am J Respir Crit Care Med* 2020. 202:e36-69.

HP: how common is it?

- USA



- Expert opinion

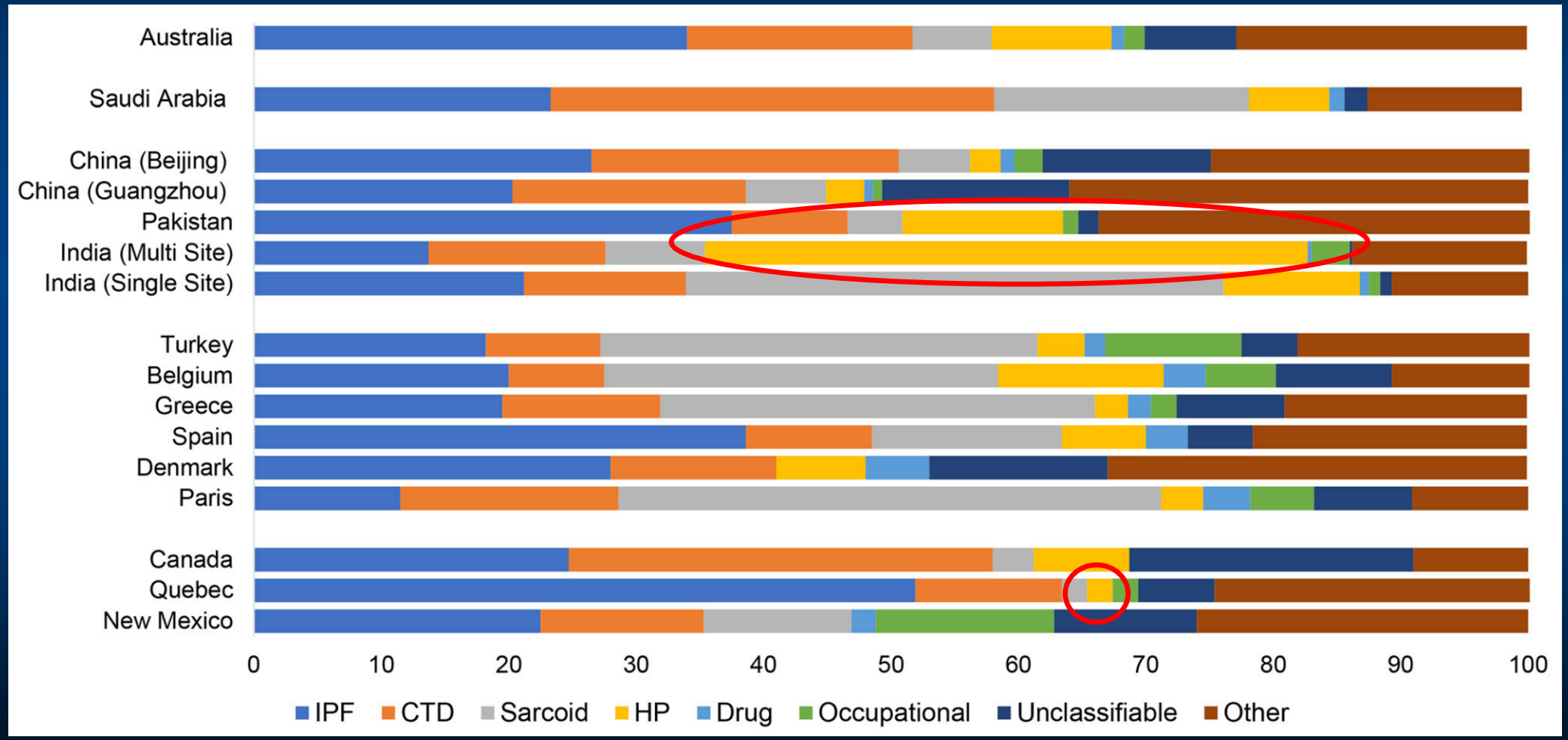
- India

Type of ILD	Number of Patients (%)
Hypersensitivity pneumonitis	513 (47.3)
Connective tissue–associated ILD	151 (13.9)
Idiopathic pulmonary fibrosis	148 (13.7)
Idiopathic nonspecific interstitial pneumonia	92 (8.5)
Sarcoidosis	85 (7.8)
Pneumoconiosis	33 (3.0)
Other	
Organizing pneumonia	34 (3.1)
Pulmonary alveolar proteinosis	4 (0.4)
Desquamative interstitial pneumonia	3 (0.3)
Drug-induced ILD	3 (0.3)
Eosinophilic pneumonia	3 (0.3)
Lymphocytic interstitial pneumonia	3 (0.3)
Lymphangioleiomyomatosis	2 (0.2)
Respiratory bronchiolitis–associated ILD	2 (0.2)
Langerhans cell histiocytosis	2 (0.2)
Pleuroparenchymal fibroelastosis	2 (0.2)
Granulomatosis with polyangiitis	1 (0.1)
Pulmonary alveolar microlithiasis	1 (0.1)
Unclassified	2 (0.2)

- Prospective registry (n=1,084)

Lederer DJ, et al. *N Engl J Med* 2018; 378:1811-1823. Singh et al. *Am J Respir Crit Care Med* 2017;195:801

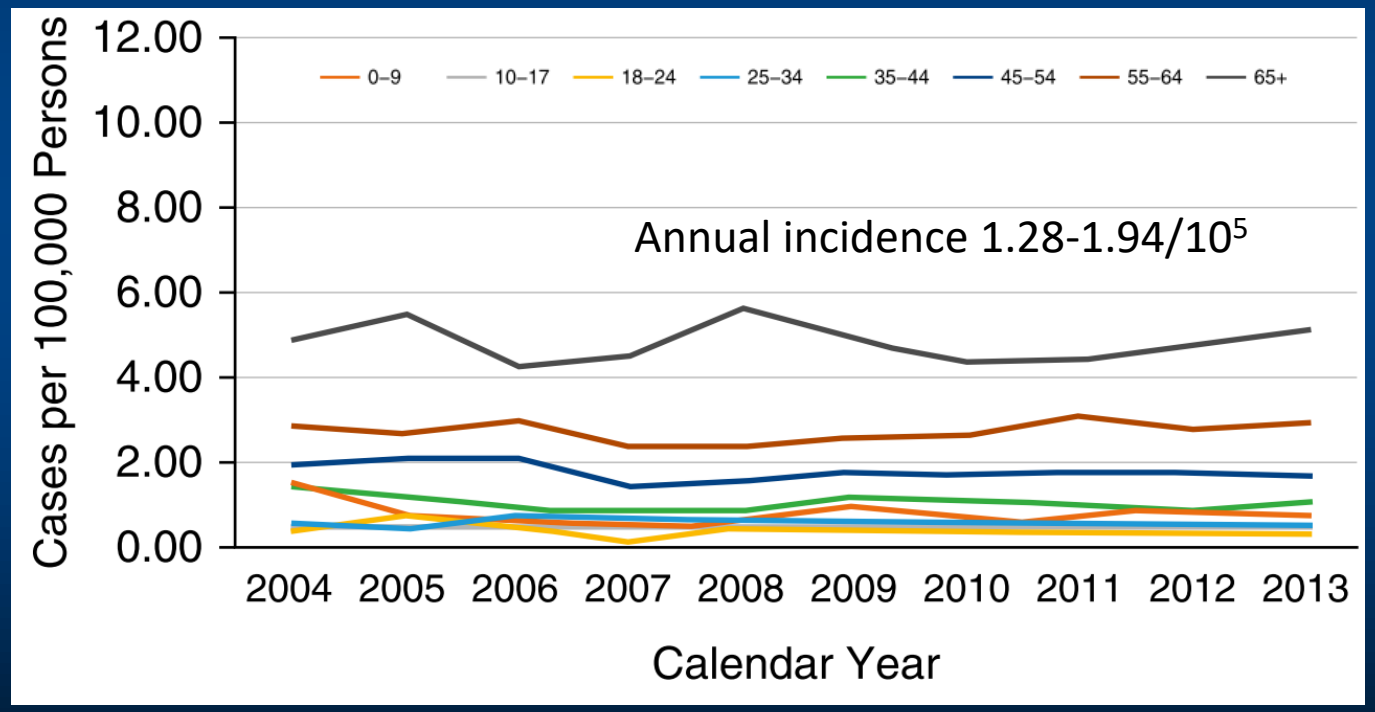
Relative frequency of HP varies by geography



Kaul B et al. *Front. Med* 2021;8:751181

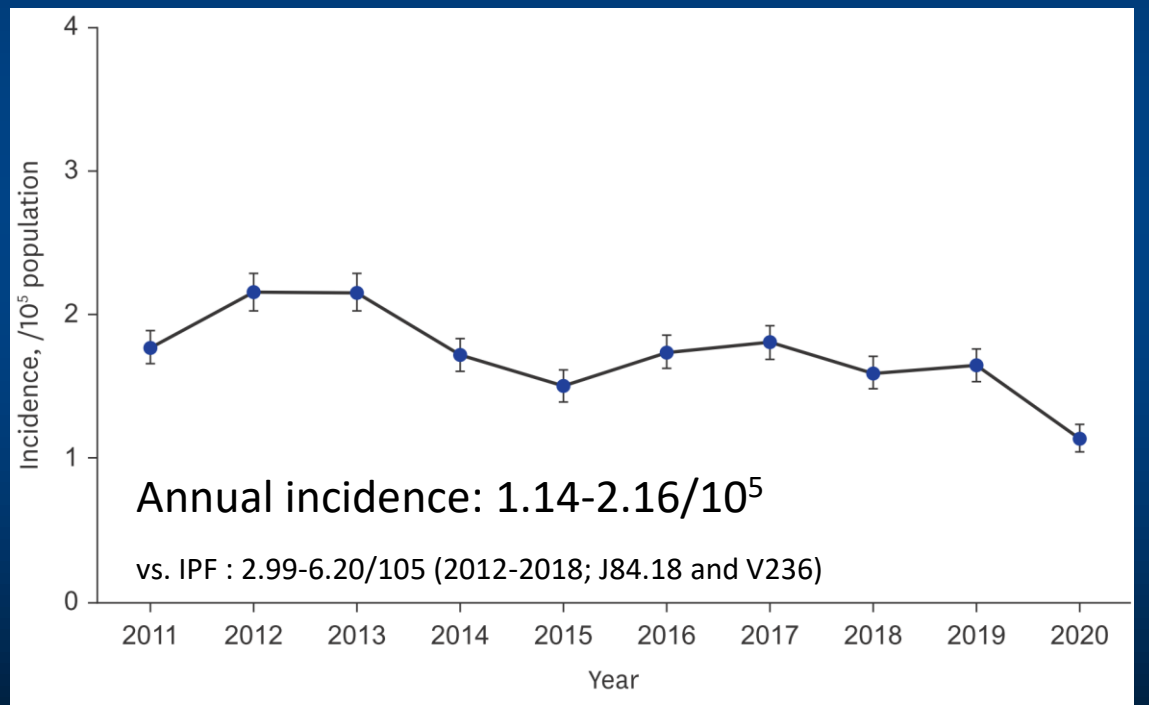
HP: incidence

- USA



- Cohort from claim database (ICD-9-Cm, 495.x; 7,498 cases;2004-2013)

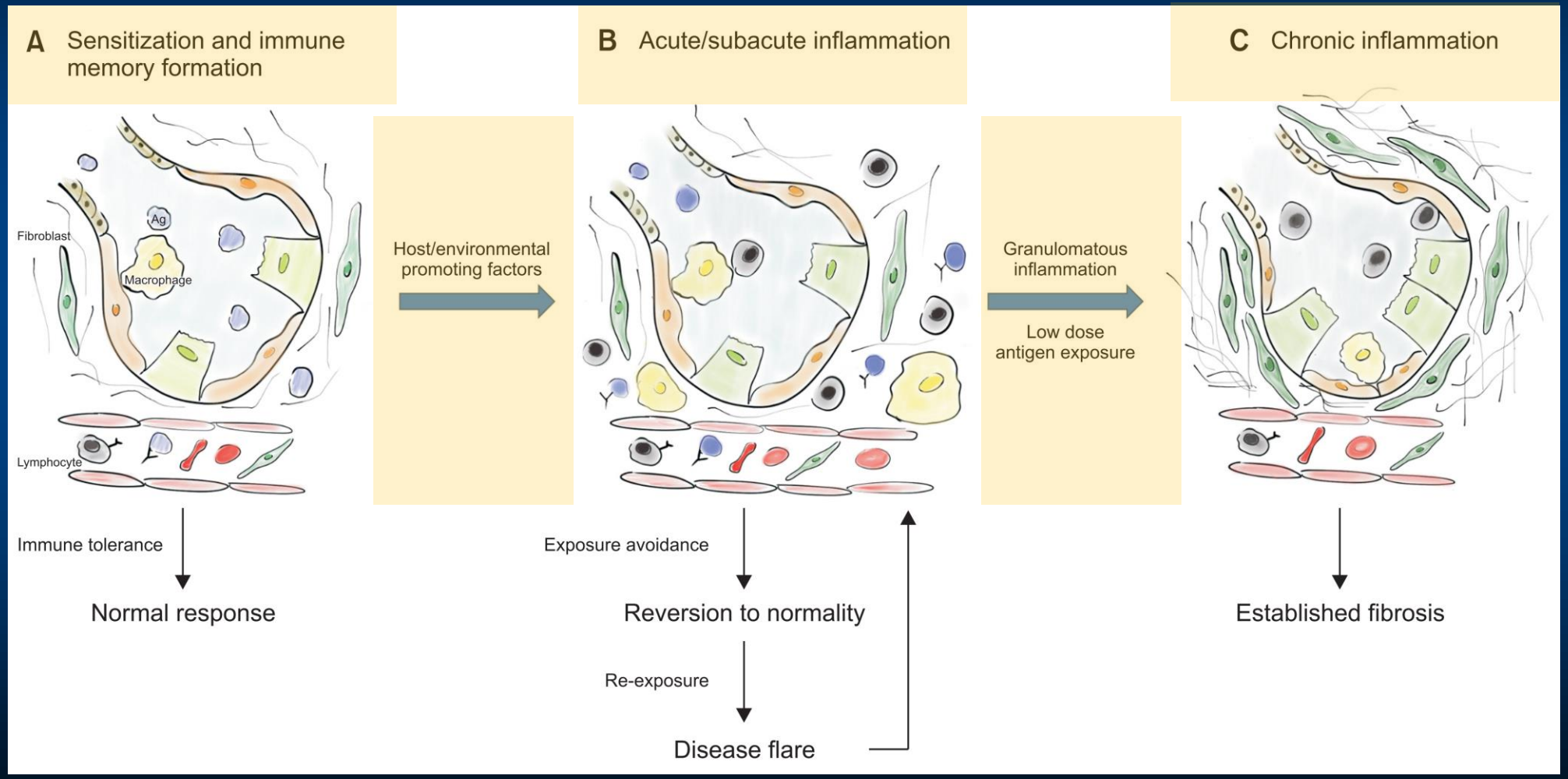
- South Korea



- Cohort from claim database (J67.9; n=8,678; 2011-2020)

Perez et al. *Ann Am Thorac Soc* 2018;15:460-469, Jung et al. *J Korean Med Scie* 2024;18:39(10):e96, Joung et al .*BMC pulmonary Medicine* 2020;23:98

HP: pathogenesis

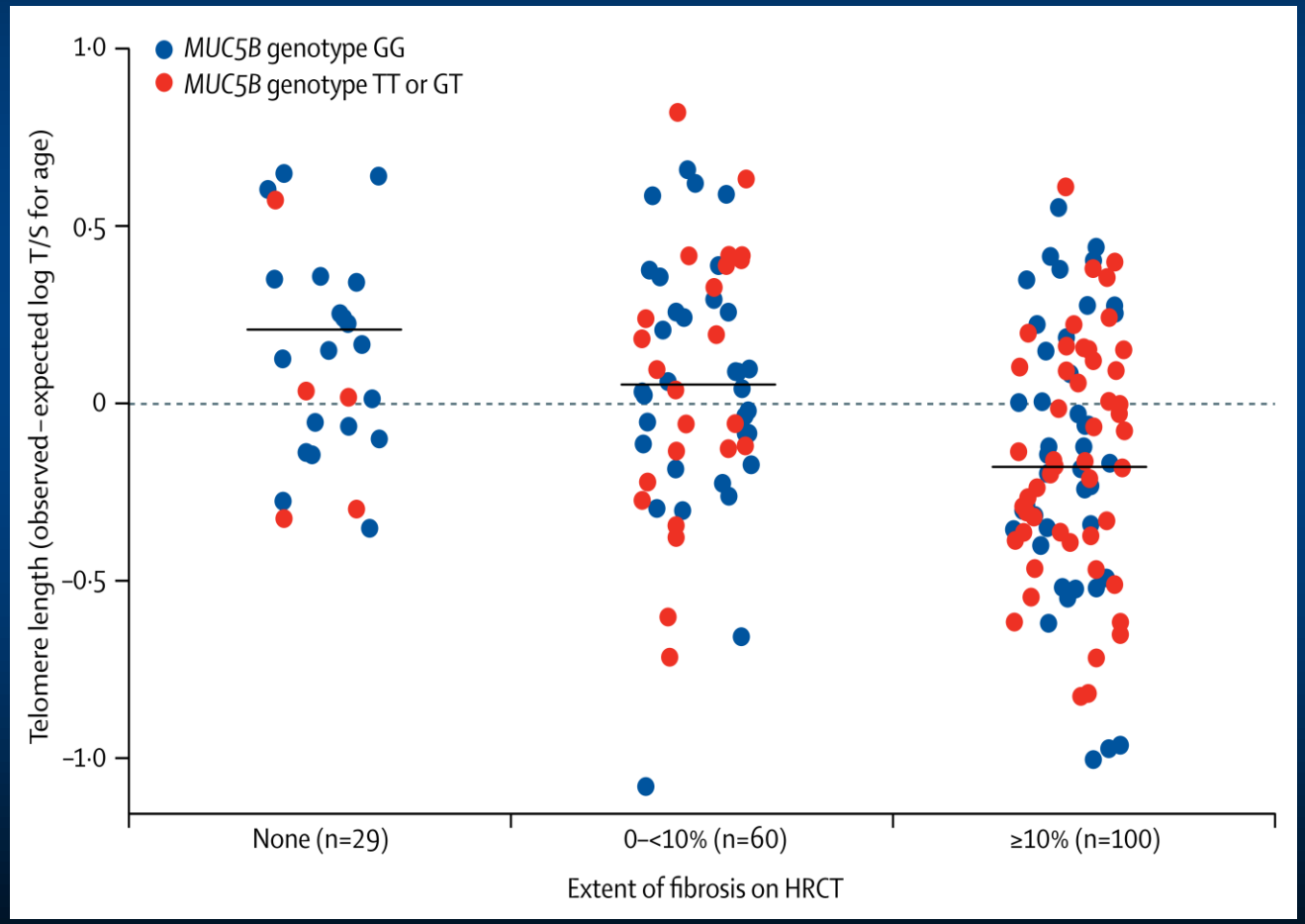


- Humoral (i.e., antigen-specific IgG antibodies) and T-helper cell type 1 (Th1) cellular immune responses; Th2(fibrosis)

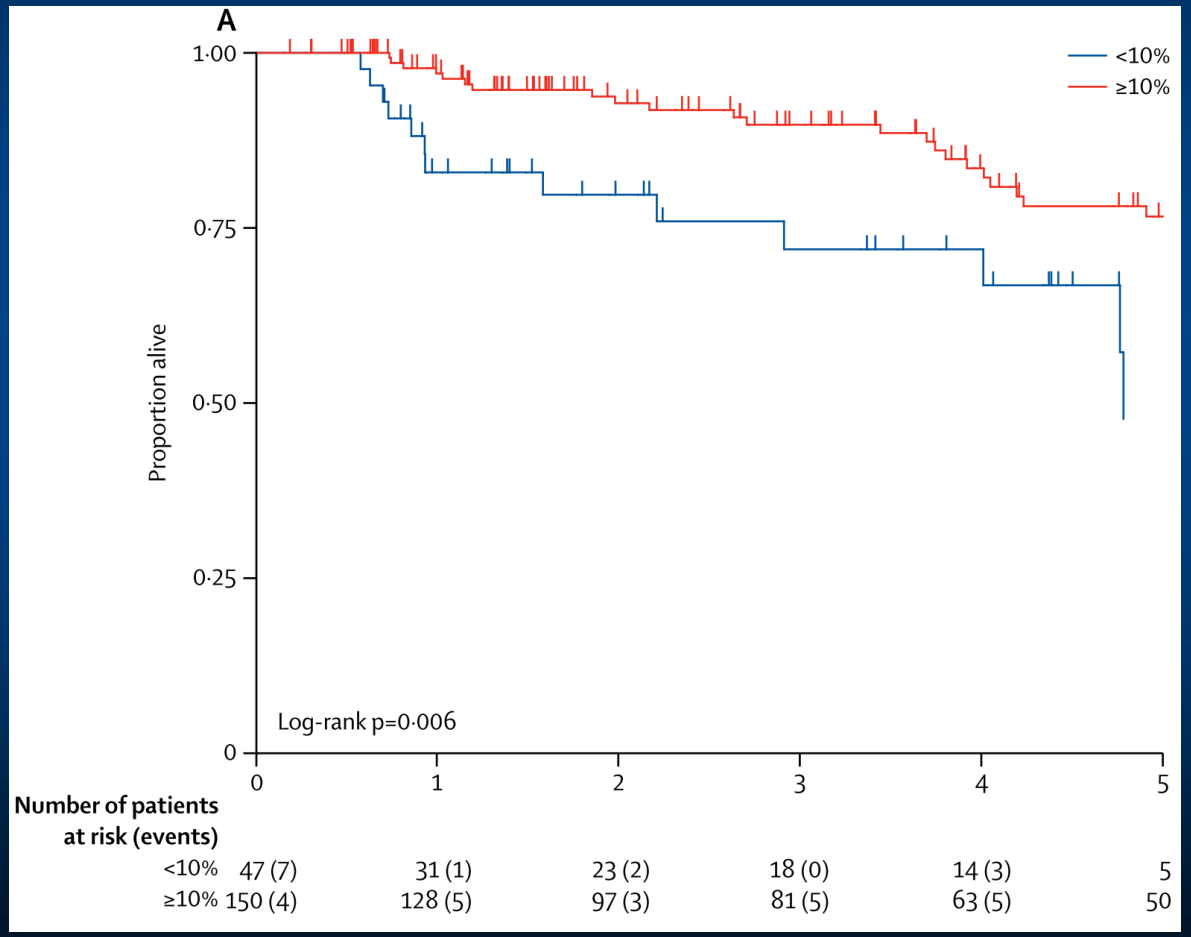
Leone PM, et al. *Tuber Respir Dis* 2020 Apr;83(2):122-131.

MUC5B promoter polymorphism and telomere length in chronic HP

- Distrubution of MUC5B promoter SNP minor allele and telomere length



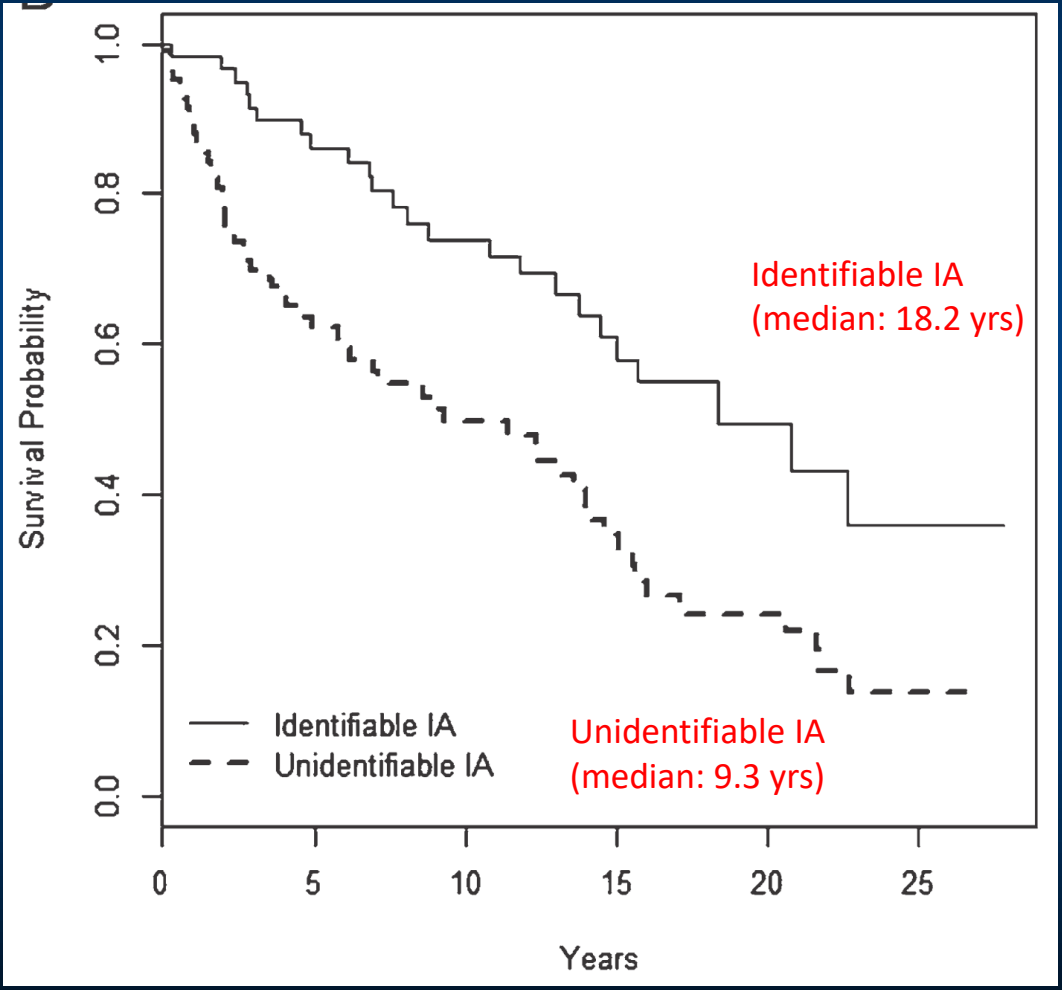
- Overall survival in chronic HP cohort



Polymorphism in major histocompatibility complex class II

Ley et al. *Lancet Respir Med* 2017;5:639-47

Identifying an inciting antigen is associated with improved survival



Variables	HR	95% CI	*P* Value
Patient age, y	1.04	1.01-1.07	.005
Previous smoking	2.01	1.15-3.50	.014
Unidentifiable IA	1.76	1.01-3.07	.047
DLCO,[a] %	1.14	0.95-1.35	.153
FVC,[b] %	1.36	1.10-1.68	.004
Pulmonary fibrosis	2.43	1.36-4.35	.002

- A single center retrospective HP cohort (n=142; unidenfied IA in 53%, IA confirmed by hygienist's report or Ab)

Perez ERF, et al. *Chest* 2013;144(5):1644-1651.

Sauces of antigens known to cause HP

Matter	Typical Sources	HP "Disease"
II. Pharmaceutical agents		
Penicillins, cephalosporins	Antibiotics	Drug-induced HP
Methotrexate	Immunosuppressive agents	
α-IFN	Immunomodulatory agents	
Lenalidomide	Hypolipidemics	
Pravastatin	Antidepressants	
Venlafaxine	Alkylating agents	
Temozolomide		
III. Metals		
Cobalt	Hard metals, alloys	Giant cell pneumonitis
Zinc (tungsten and alloys)	Zinc fumes	Zinc-fumes alveolitis
Zirconium	Zircon	Zirconium alveolitis
Beryllium	Batteries, computers, neons	Beryllium HP
TMI	Organometallic compound for semiconductors used in industry	—
Yeasts		
Candida spp.		
Geotrichum candidum		
Saccharomyces cerevisiae		
Saccharomonospora viridis		
Saccharopolyspora rectivirgula		
Torulopsis glabrata		
Trichosporon cutaneum		
Silkworm proteins	Dust from silkworm larvae and cocoon	Silkworm rearer's lung
Weevils (corn, wheat) (*Sitophilus* spp.)	Contaminated grain or flour	Corn (wheat)–weevil lung
Plant proteins		
Alginate	Seaweed	—
Argan cake	Cosmetics, unsaturated fatty acids, phytosterol	—
Catechin	Green-tea powder	—
Esparto dust	Esparto grass	Esparto lung, plasterer's lung
Grain flour (wheat, rye, oats, maize)	Flour dust	Flour-dust alveolitis
Malt	Food-processing industry	—
Legumes (soy)	Legumes (soya) flour dust	Soya-dust alveolitis

HP: inciting antigen

- Farmer's lung (Aspergillus sp.)

- Hot-tub lung (NTM)

- Bird-breeder's lung, Feather-duvet lung (avian droppings, serum, feathers)

HP: inciting antigen

- Mouldy walls, Steam iron alveolitis (Iron's steam), Humidifier lung (Alternaria alternate, Candida)




- Saxophone player's lung (Ulocladuim botrytis, Penicilium), Trombone player's lung


Raghu G, et al. *Am J Respir Crit Care Med* 2020. 202:e36-69.

HP in Korea: exposure history to causative antigens

- AMC

Characteristics	Total
Patients, number	101
Microbes (mold, humid hay, cotton)	50 (49.5)
Chemical (insecticides, cement, dye, fertilizers)	18 (17.8)
Animal protein (birds' feather)	8 (7.9)
Enzymes (mushrooms)	1 (1.0)
Metal (fumes)	1 (1.0)
Pharmaceutical agents (drugs)	1 (1.0)
Plant proteins (flour, vegetable processing)	7 (6.9)
Unidentifiable antigen	15 (14.9)

- A single center retrospective fibrotic HP cohort (AMC , n=101)

- SMC

Etiology	Total (n = 43)
Household mold	21 (48.8)
Drugs	1 (2.3)
Inorganic metal or chemical	6 (14.0)
Hot tub lung	2 (4.7)
Plants	5 (11.6)
Unknown	8 (18.6)
Total	43 (100.0)

- A single center retrospective HP cohort (SMC , n=43, fHP 12)

Kang JE, et al. *Respir Res* 2021;22:152159. Zo et al. *Ther Adv Respir Dis* 2023;17:1-10

Clinical characteristics : HP vs. IIP

	fHP (AMC)	HP (SMC)	HP (Cases)	HP (HIRA)	IPF (AMC)	fNSIP (AMC)
Patient Number	101	43(fHP:12)	46	8,678	1,114	72
Age	60.4(12.8)	57.8(9.3)	44.6	52.6(18.9)	65.7(8.2)	54.3(10.1)
Male	50(49.5)	21(48.8)	21(45.7)	4,472(51.5)	897(80.5)	23(31.9)
Ever-smokers	38(37.6)	20(46.5)	NA	NA	846(75.9)	21(29.2)

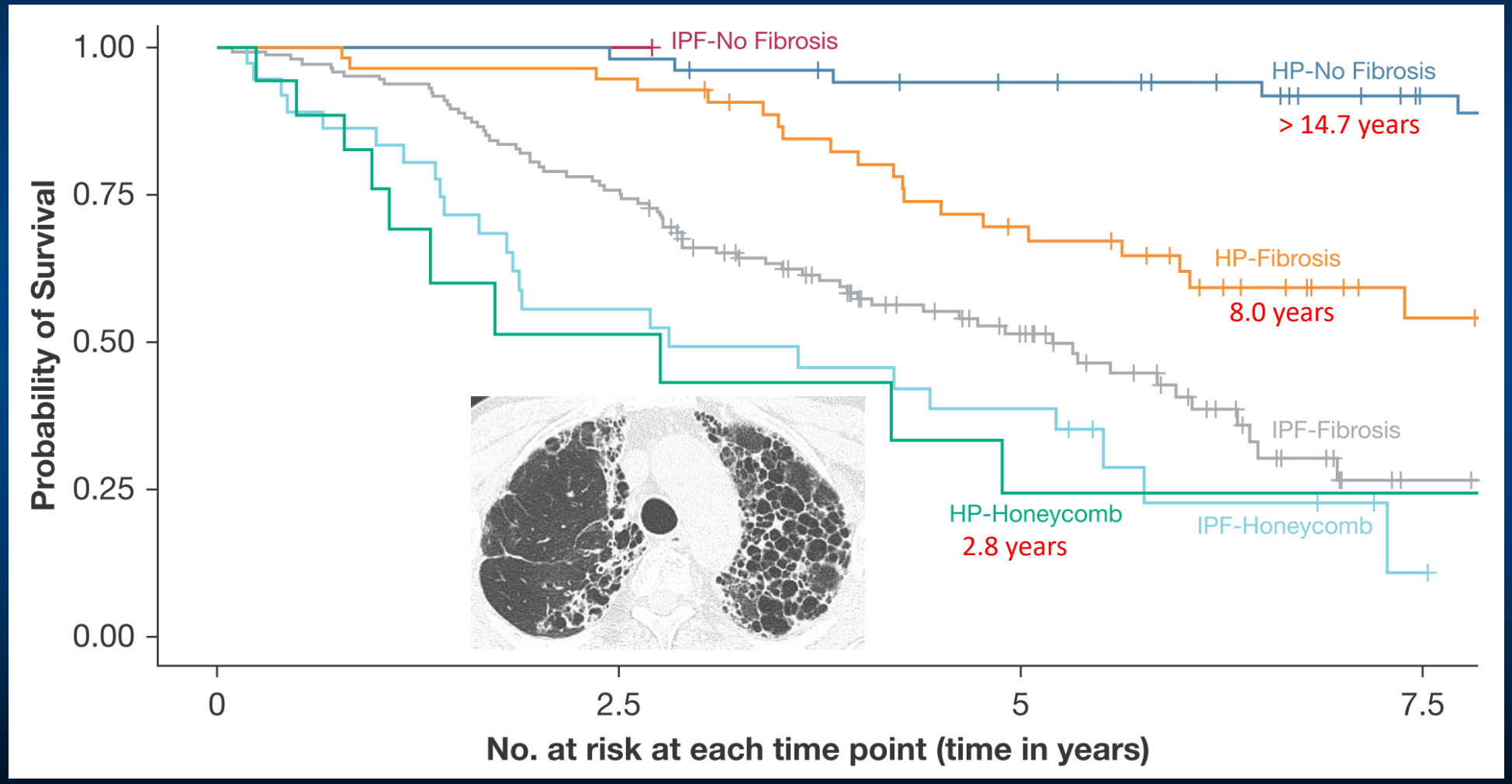
Yoon HY et al. *Eur Respir J* 2021;57(5):2001877, Kang J et al. *Respir Res* 2021;22(1):152, Park IN et al. *Eur Respir J* 2009;33(1):68-76, Jung et al. *J Korean Med Sci* 2024;39(10):e96, Zo et al. *Ther Adv Respir Dis* 2023;17:1-10

HP: prognostic factors

Intrinsic factors	Older age
	Male sex
	Genetic predisposition
Exposures	Unidentifiable inciting antigen
	Duration of exposure to inciting antigen
	History of smoking
Physiology	Low FVC
	Low D_{LCO}
	Decline in FVC
	Lower BAL lymphocytosis
Radiology	Presence of fibrosis on HRCT
	Extent of fibrosis on HRCT
	UIP pattern on HRCT
Histology	UIP pattern
	Fibrotic NSIP pattern

Hamblin M, et al. *Eur Repir Rev* 2022;31:210169

Radiologic phenotypes are associated with survival in HP



Non-fibrotic HP

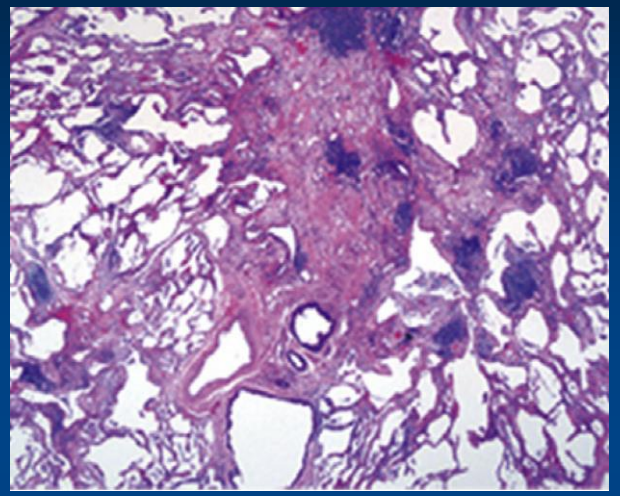
Fibrotic-HP -no HC

Fibrotic-HP - HC

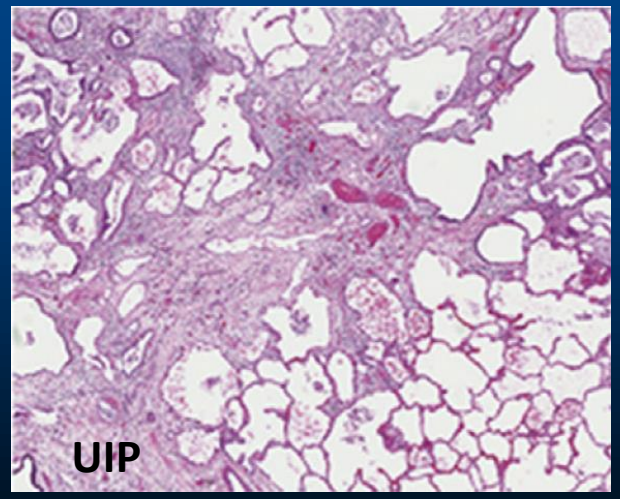
- A retrospective HP cohort (n=117); fibrosis: reticulation and/or traction bronchiectasis; plot adjusted by age, sex, and FVCl; HC: honeycombing

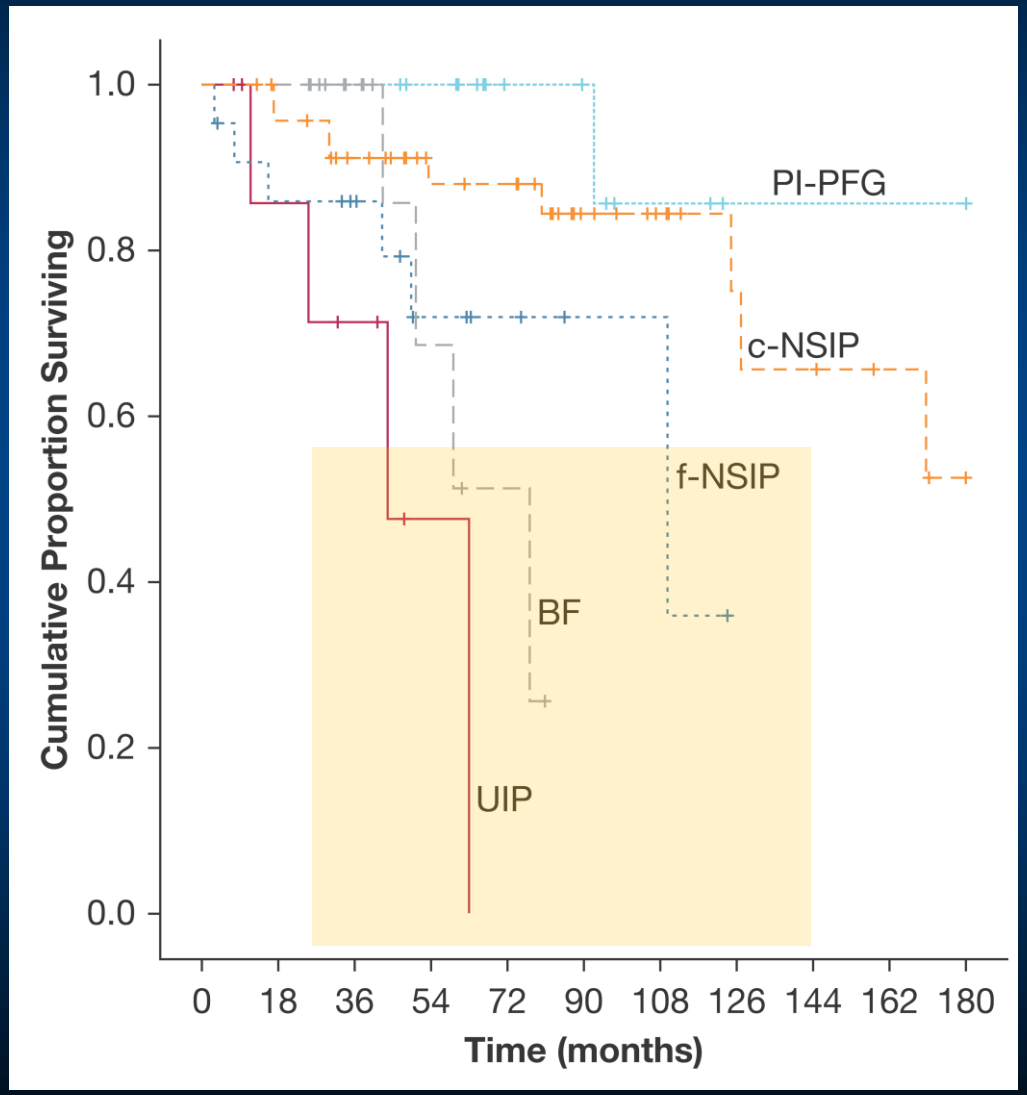
Salisbury ML, et al. Chest 2019;155(4):699-711.

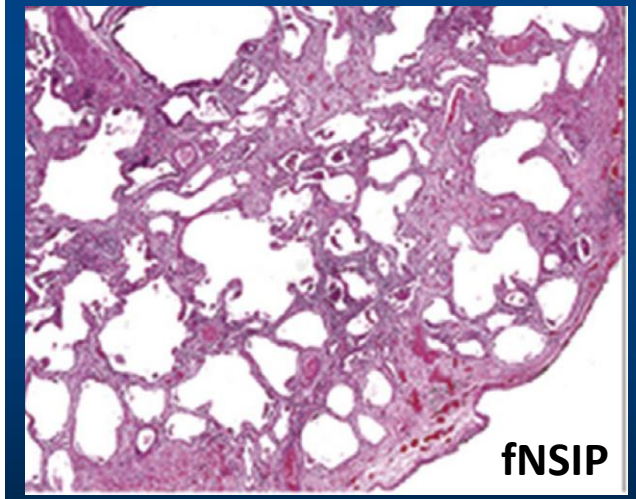
Pathologic patterns are associated with survival in chronic HP



Peribronchiolar fibrosis





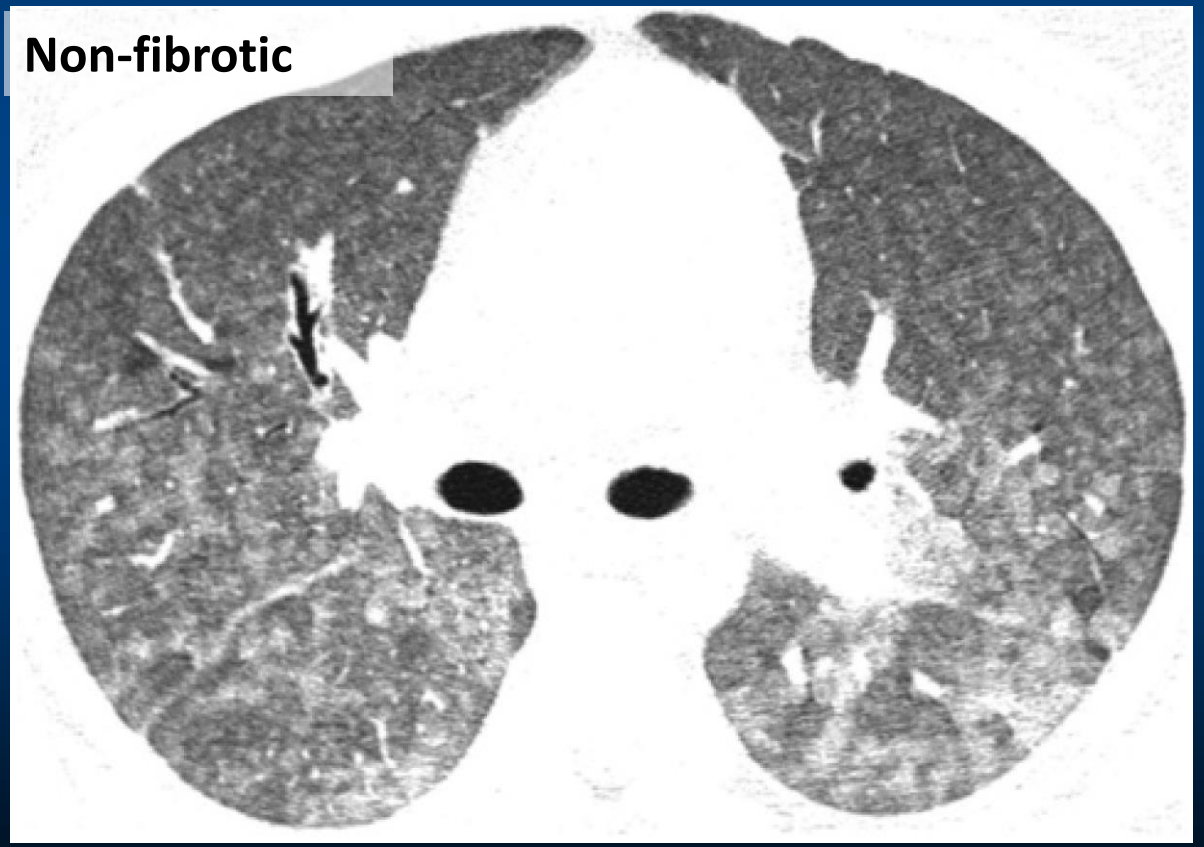


- A prospective cHP cohort (n=119); BF: bronchiolocentric fibrosis, PI-PFG: peribronchiolar inflammation with poorly formed granuloma

Wang P, et al. *Chest* 2017;152(3):502-509.

Diagnosis of Hypersensitivity Pneumonitis in Adults

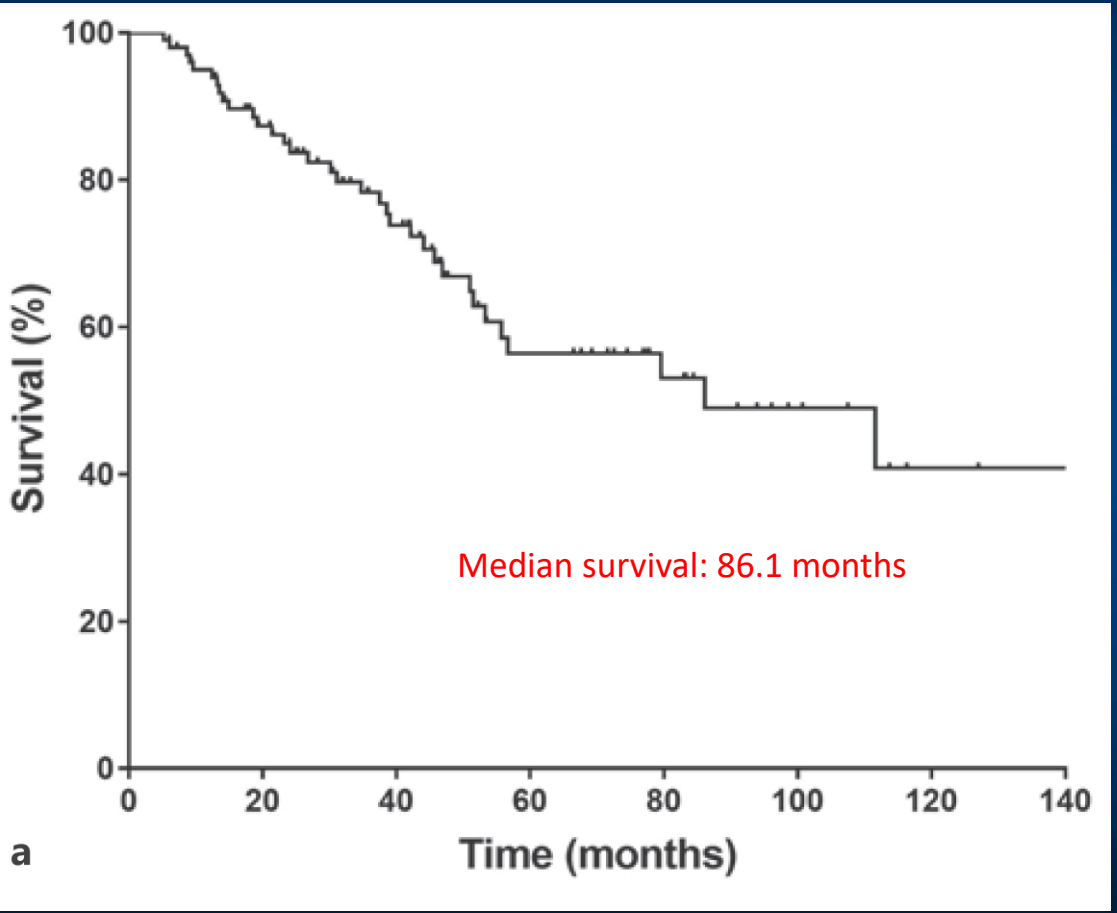
An Official ATS/JRS/ALAT Clinical Practice Guideline

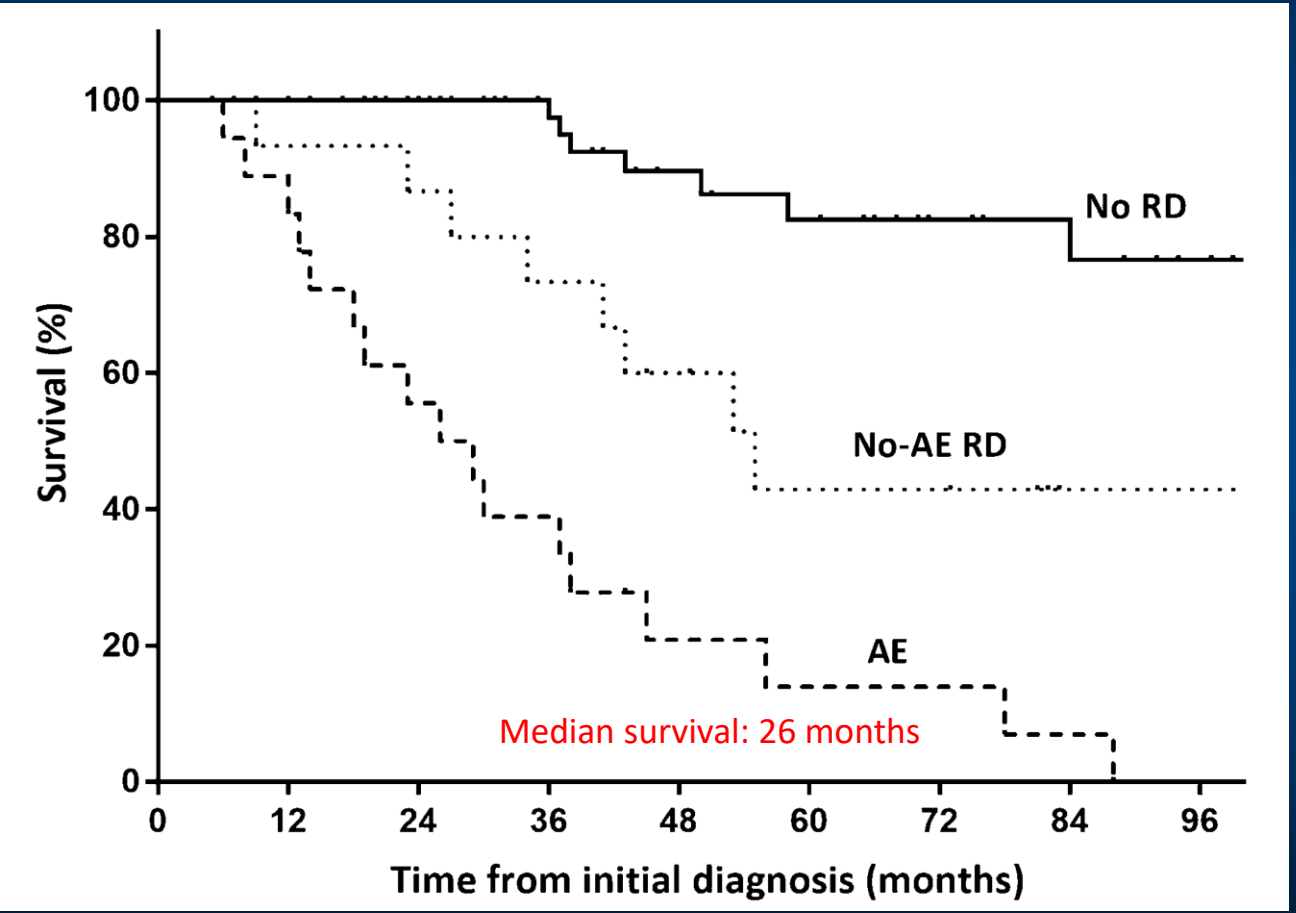


Acute, subacute or choronic HP based on the duration of symptoms

Raghu G, et al. *Am J Respir Crit Care Med* 2020. 202:e36-69.

Survival from the initial diagnosis in Korean patients with fibrotic HP





- A single-center retrospective fHP cohort (n=101), AE in 17.8% (median follow up: 30 months)

Kang et al. *Respir Res* 2021;22:152

6 과민성폐렴

I. 정의와 발병기전
II. 임상양상, 분류, 영상 및 병리소견
III. 진단
IV. 치료
V. 예후
VI. 국내 현황

OCIETY

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Check

avis, MD, FCCP; David A. Lynch, MB, BCh;
MPH; Moisés Selman, MD; Jay H. Ryu, MD, FCCP;
, FCCP; Carlos A. C. Pereira, MD, FCCP;
; Naohiko Inase, MD, PhD;
e, MD, FCCP; and Lindsy Frazer-Green, PhD

Raghu G, et al. *Am J Respir Crit Care Med* 2020. 202:e36-69, Perez et al. *CHEST* 2021;160(2): e97-e156, KATRD, ILD 임상진료지침 2023

ACCP: ILD patient questionnaire

15. Have you lived or worked in environment where you were exposed to heavy smoke or dust? ☐ Yes ☐ No

16. Occupational history: *Please include all occupations in your life.*

Occupation	Years worked	Exposures *(Dust, metal, paint, fine particles, etc)*

17. Have you ever performed any of the following occupations?

- ☐ Farm work
- ☐ Painter
- ☐ Sand blaster
- ☐ Pipe fitter
- ☐ Automotive mechanic
- ☐ Welder
- ☐ Insulator
- ☐ Vineyard worker
- ☐ Carpenter
- ☐ Laboratory worker
- ☐ Longshoreman

18. Have you ever worked in any of the following locations?

- ☐ Mine
- ☐ Quarry
- ☐ Pulp mill
- ☐ Bakery
- ☐ Foundry
- ☐ Railroad
- ☐ Paper mill
- ☐ Smelting
- ☐ Plastic factory
- ☐ Tunnel construction

19. Have you ever been exposed to the following at work/ home/ elsewhere?

Animals and farming
- ☐ Birds
- ☐ Feathers
- ☐ Fishmeal
- ☐ Insecticide
- ☐ Fertilizer

Metals/rocks
- ☐ Beryllium
- ☐ Cobalt
- ☐ Tin
- ☐ Iron oxide
- ☐ Aluminum
- ☐ Mica
- ☐ Silica
- ☐ Asbestos
- ☐ Coal

Food/ plant Production
- ☐ Cheese
- ☐ Maple Bark
- ☐ Wheat
- ☐ Coffee/ tea
- ☐ Mushroom
- ☐ Oil
- ☐ Sugar cane
- ☐ Malt
- ☐ Meat

Miscellaneous
- ☐ Cotton
- ☐ Wood
- ☐ Industrial strength cleaning solution
- ☐ Oily Nosedrops

Skilled
- ☐ Cork
- ☐ Detergent *(isocyanates)*
- ☐ Pottery
- ☐ Talc
- ☐ Paint
- ☐ Cement
- ☐ Pipes
- ☐ Brakes
- ☐ Tile *(ceramic)*

16. 다음 직업 중 종사한 적이 있는 직업이 있으시면 표시해주십시오.

농부	○ 네	○ 아니오
도장공(페인트칠)	○ 네	○ 아니오
샌드블라스터(모래분사기)작업	○ 네	○ 아니오
배관공	○ 네	○ 아니오
자동차 정비	○ 네	○ 아니오
용접공	○ 네	○ 아니오
절연(전기 통하지 않도록) / 단열 / 방음 처리	○ 네	○ 아니오
과수원	○ 네	○ 아니오
목수	○ 네	○ 아니오
실험실 업무	○ 네	○ 아니오
부두 노동자	○ 네	○ 아니오

17. 다음 장소에서 근무한 적이 있으십니까?

광산	○ 네	○ 아니오
주조(주물)공장	○ 네	○ 아니오
제련(용광로)공장	○ 네	○ 아니오
채석장	○ 네	○ 아니오
철로	○ 네	○ 아니오
플라스틱 제조 공장	○ 네	○ 아니오
펄프 제작소	○ 네	○ 아니오
제지 공장	○ 네	○ 아니오
터널 건설 현장	○ 네	○ 아니오
제과점(제과 제빵업)	○ 네	○ 아니오

18. 집 / 작업장 등에서 다음에 노출된 적이 있으시면 표시해주십시오.

동물 / 농업 관련

새	○ 네	○ 아니오	깃털	○ 네	○ 아니오
어분(말린 생선가루)	○ 네	○ 아니오	살충제	○ 네	○ 아니오
비료	○ 네	○ 아니오			

https://foundation.chestnet.org/wp-content/uploads/2020/04/Interstitial-Diffuse-Lung-Disease-Patient-Questionnaire.pdf

HP: online repository of potential cause

hpLung

EXPOSURES ANTIGENS ABOUT

Browsing Exposures

Or search... Go

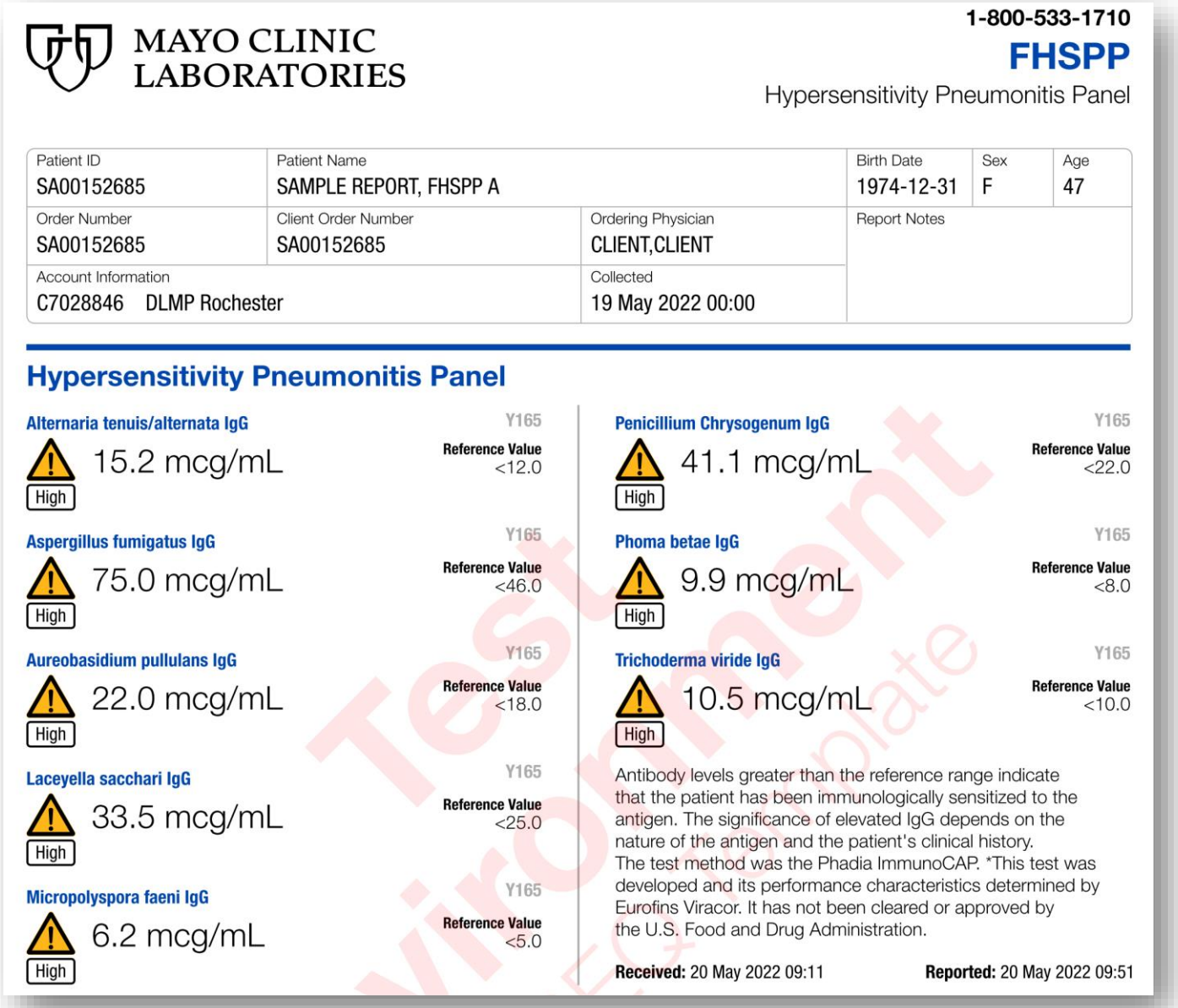
A	Cases
Air Conditioners	48
Argan Cake	2
B	
Bagasse	16
Baker's Yeast	1
Bathtubs	2
Bats	1
Bed Cleaner	1
Birds, Mixed or NOS	181
Blackbirds	8
Blacksmiths	1
Broom Grass	1
Budgerigars	103

Birds, Mixed or NOS

Also described as bird fancier's lung, bird fancier's disease
There are **181 cases** described in **29 citations**

Citation	Antigens	Cases
2019 Moasaic attenuation Marchiori, E., et al. *Jornal Brasileiro De Pneumologia: Publicacao Oficial Da Sociedade Brasileira De Pneumologia E Tisilogia.*		1
2018 [A Case of Acute Exacerbation of Chronic Birdrelated Hypersensitivity Pneumonitis with a Remarkable Elevation of Environmental Avian Antigen Levels] Suzuki, T., et al. *Arerugi.*	Pigeon Droppings	1
2015 Hypersensitivity pneumonitis associated to birds care González-Zúñiga, A. M., et al. *Revista Facultad de Medicina.*		1
2015 Identical Twins, Matching Symptoms: Hypersensitivity Pneumonitis Chen, C., et al. *American Journal of Medicine.*		2
2015 Pneumomediastinum: a rare manifestation of hypersensitivity pneumonitis in a patient presenting with unexplained breathlessness at the Borders General Hospital Grecian, R., et al. *BMJ Case Reports.*	Avian antigens	1
2015 [Chronic form of bird breeder's disease: about one observation] Frikha, F., et al. *The Pan African Medical Journal.*		1
2014 [Hypersensitivity pneumonitis in the school environment] Callero, A., et al. *Anales De Pediatria.*	Aspergillus spp., Canary droppings	1
2013 Bird fancier's lung complicated by pulmonary nocardiosis Komiya, K., et al. *Jornal Brasileiro De Pneumologia.*		1

Serological evaluation: specific IgG test



MAYO CLINIC LABORATORIES

1-800-533-1710

FHSPP

Hypersensitivity Pneumonitis Panel

Patient ID	Patient Name		Birth Date	Sex	Age
SA00152685	SAMPLE REPORT, FHSPP A		1974-12-31	F	47
Order Number	**Client Order Number**	**Ordering Physician**	**Report Notes**		
SA00152685	SA00152685	CLIENT,CLIENT			
Account Information		**Collected**			
C7028846 DLMP Rochester		19 May 2022 00:00			

Hypersensitivity Pneumonitis Panel

		Y165 Reference Value
Alternaria tenuis/alternata IgG	15.2 mcg/mL High	<12.0
Aspergillus fumigatus IgG	75.0 mcg/mL High	<46.0
Aureobasidium pullulans IgG	22.0 mcg/mL High	<18.0
Laceyella sacchari IgG	33.5 mcg/mL High	<25.0
Micropolyspora faeni IgG	6.2 mcg/mL High	<5.0
Penicillium Chrysogenum IgG	41.1 mcg/mL High	<22.0
Phoma betae IgG	9.9 mcg/mL High	<8.0
Trichoderma viride IgG	10.5 mcg/mL High	<10.0

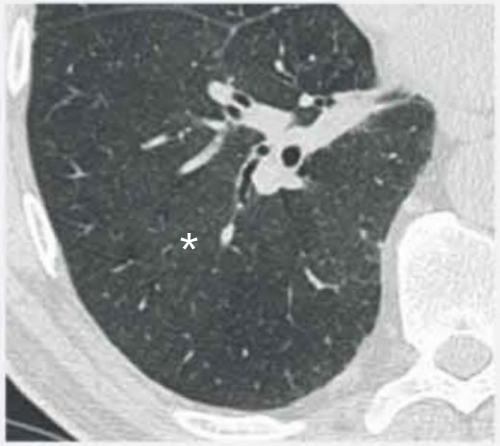
Antibody levels greater than the reference range indicate that the patient has been immunologically sensitized to the antigen. The significance of elevated IgG depends on the nature of the antigen and the patient's clinical history.
The test method was the Phadia ImmunoCAP. *This test was developed and its performance characteristics determined by Eurofins Viracor. It has not been cleared or approved by the U.S. Food and Drug Administration.

Received: 20 May 2022 09:11 **Reported:** 20 May 2022 09:51

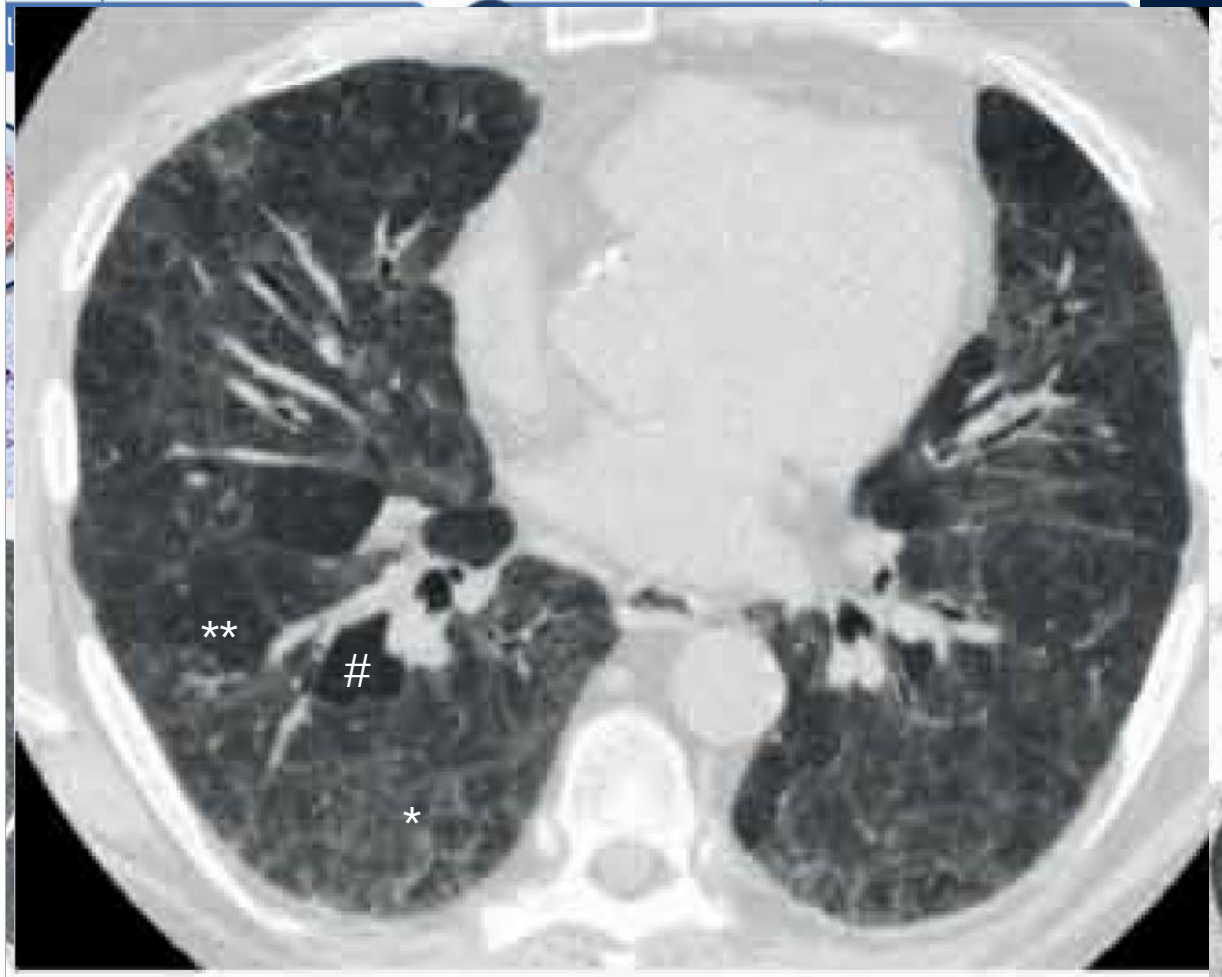
- Suspicious or undetected exposure
- Sensitization vs. cause of disease

HRCT findings in HP

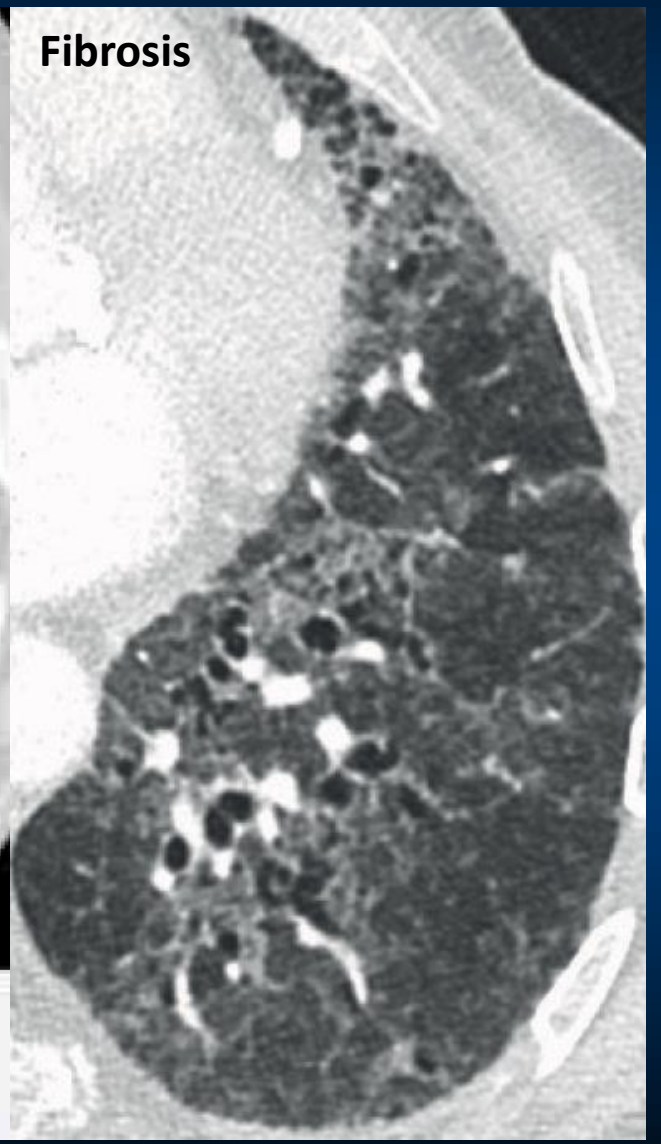
c) Interstitial inflammation



Ground glass



Three-density pattern



Typical, compatible, indeterminate

Hamblin M, et al. *Eur Repir Rev* 2022;31:210169

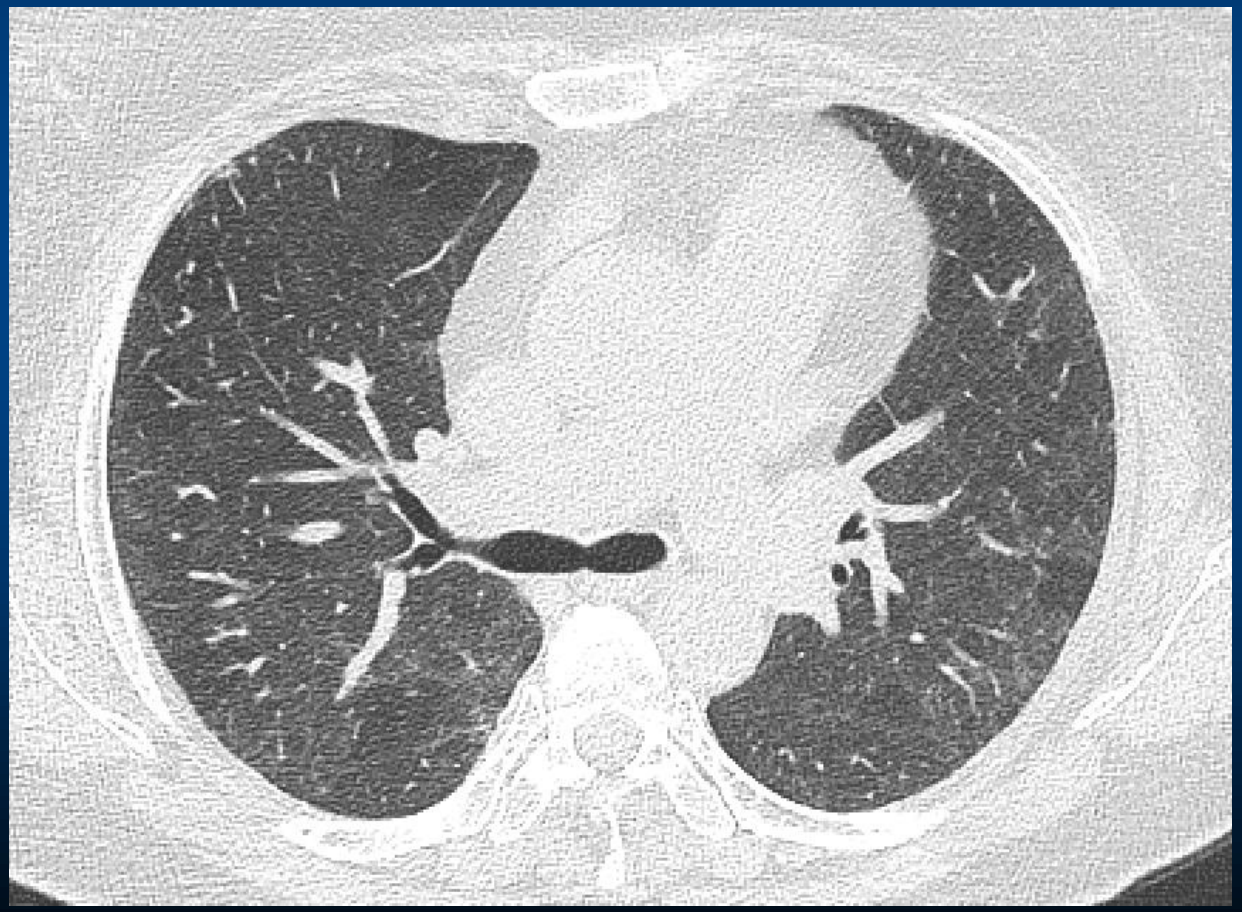
Non-fibrotic HP: typical HP pattern

- **Diffuse** poorly defined centrilobular **nodules**

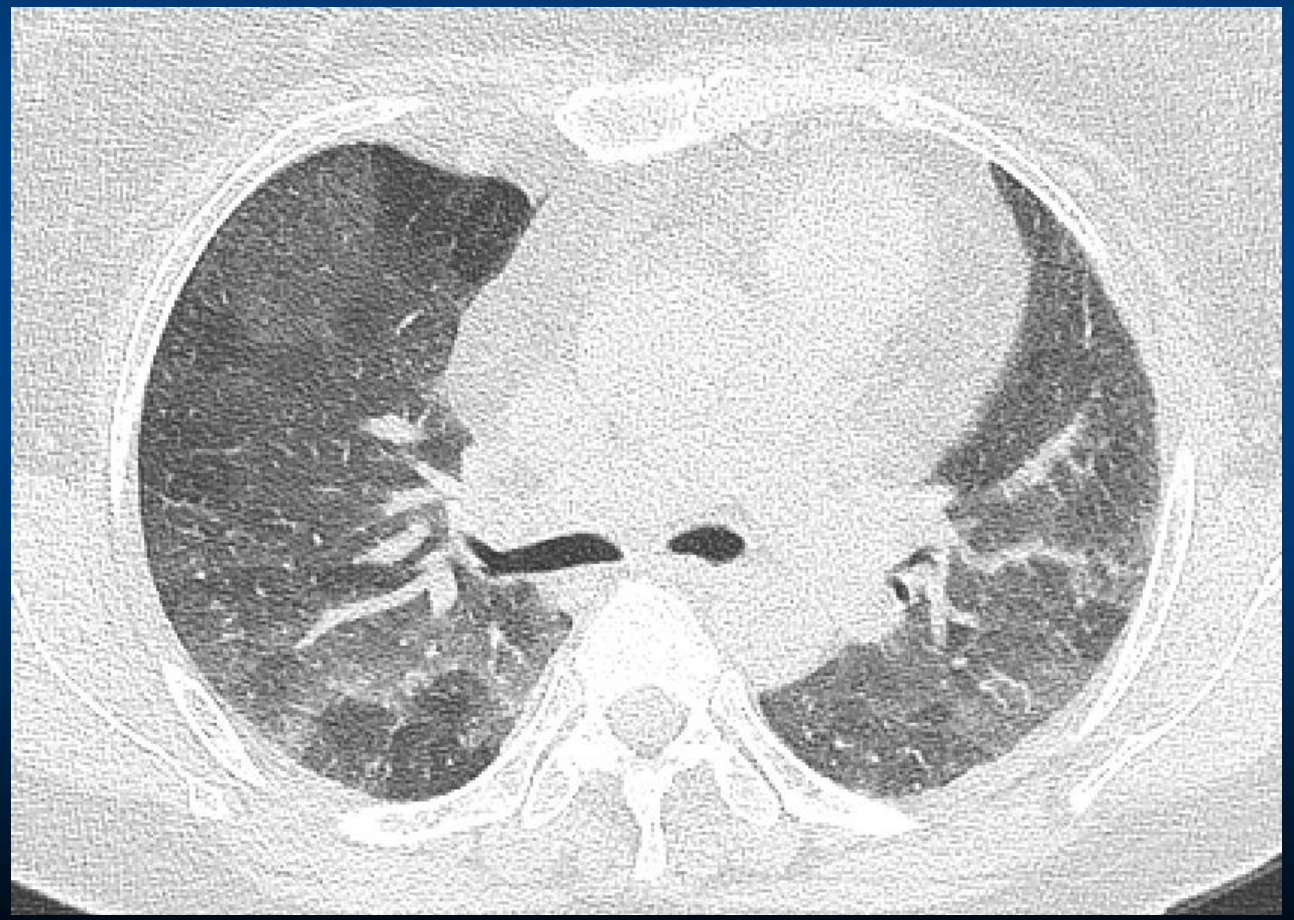
- **Mosaic attenuation:**
  - **GGO** interposed with decreased attenuation

Non-fibrotic HP: typical HP pattern

- **Diffuse** bilateral **GGO** and **mosaic** attenuation

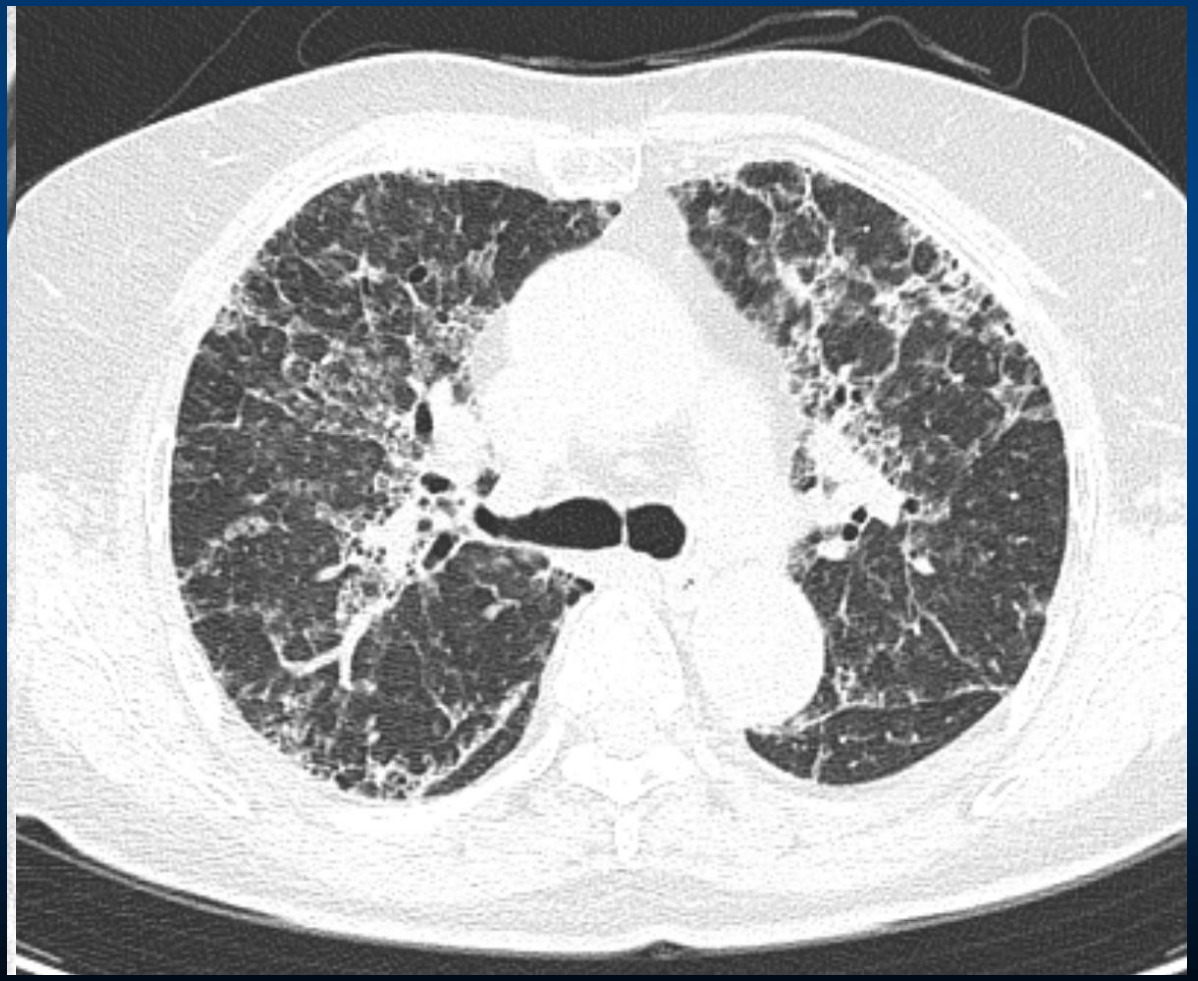


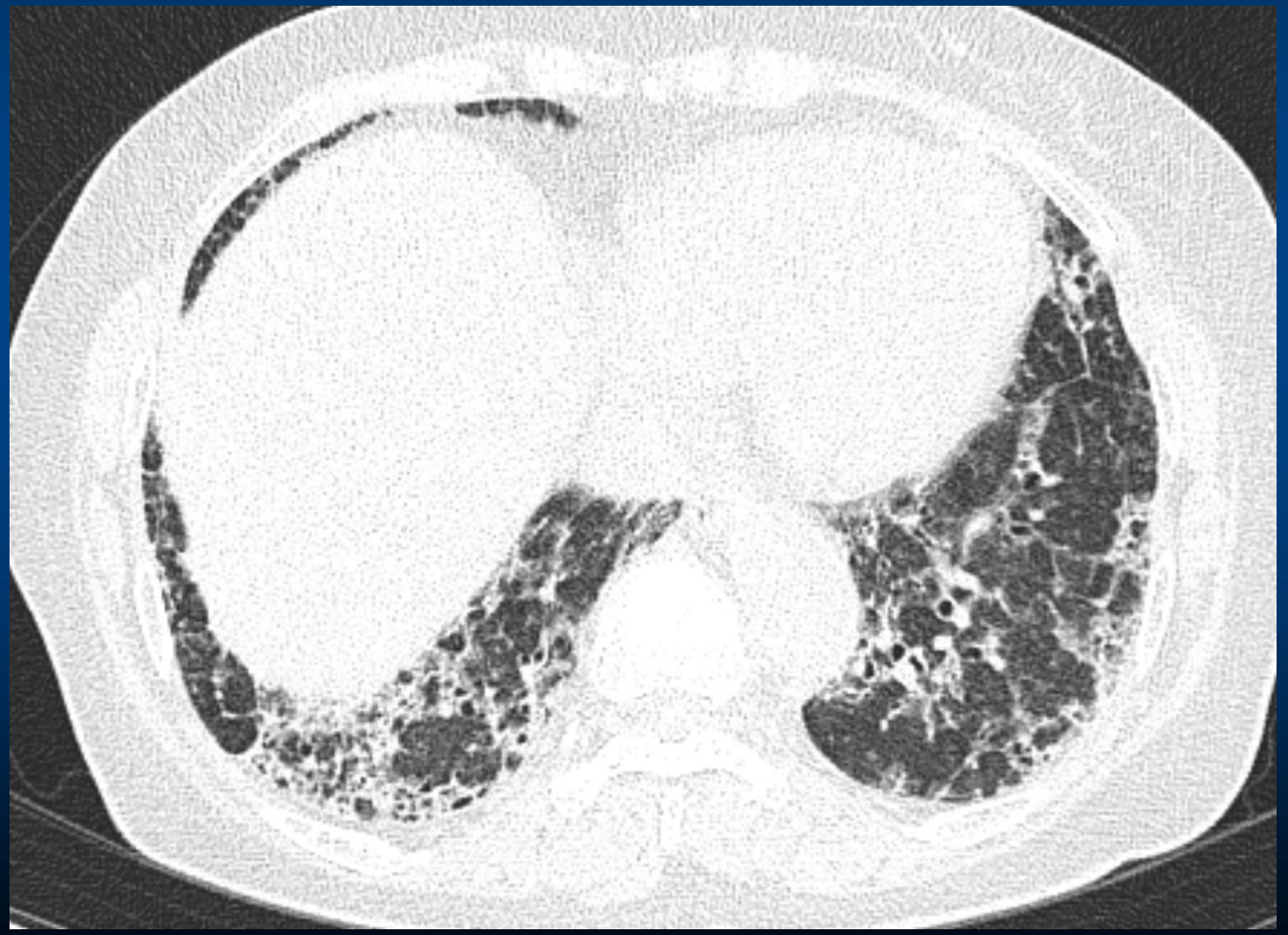
- **Air-trapping:**
  - exaggeration of mosaic attenuation on expiratory



Fibrotic HP: typical HP pattern

- **Diffuse** distribution, **peribronchovascular fibrosis** with nodules, **mosaic** attenuation

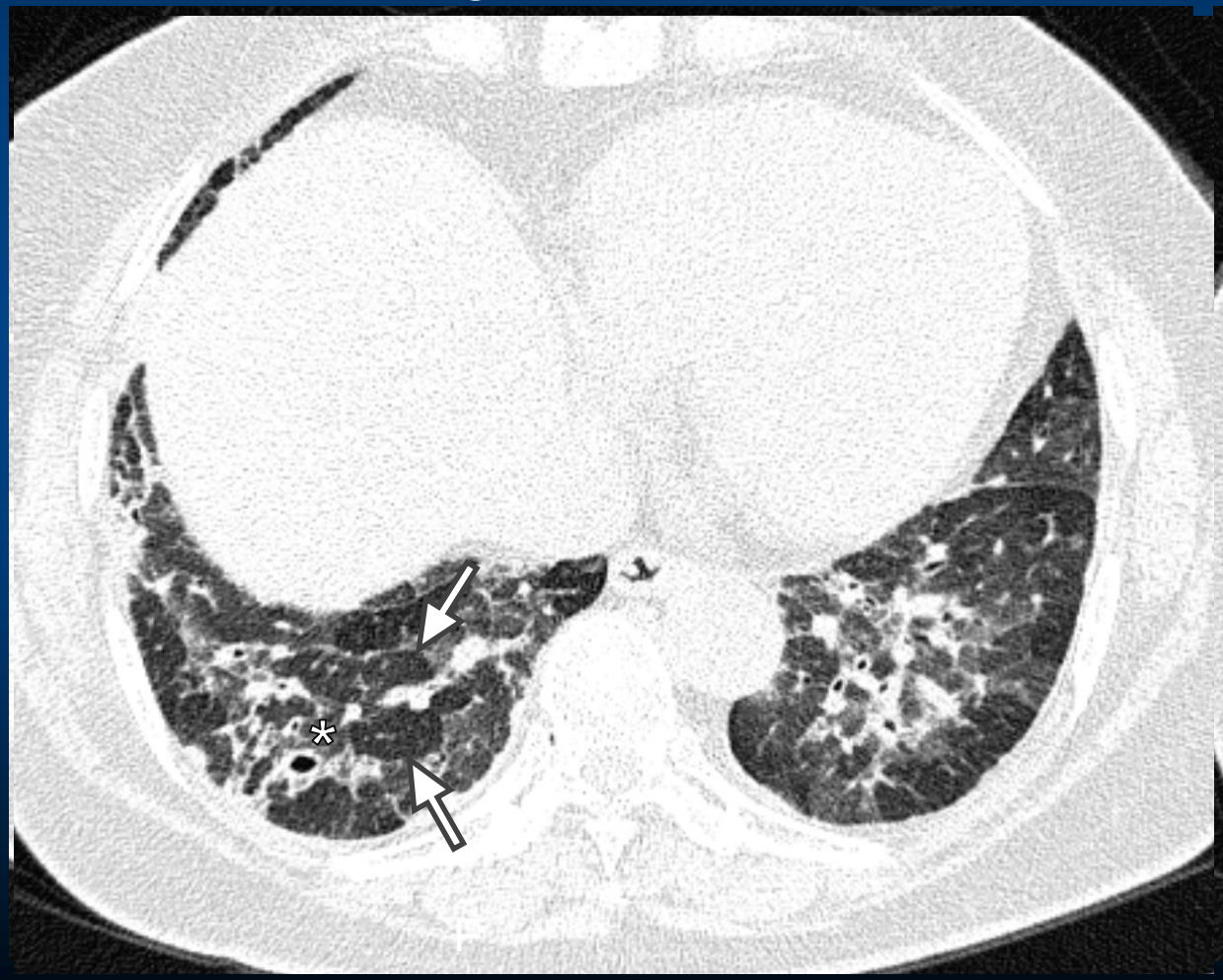




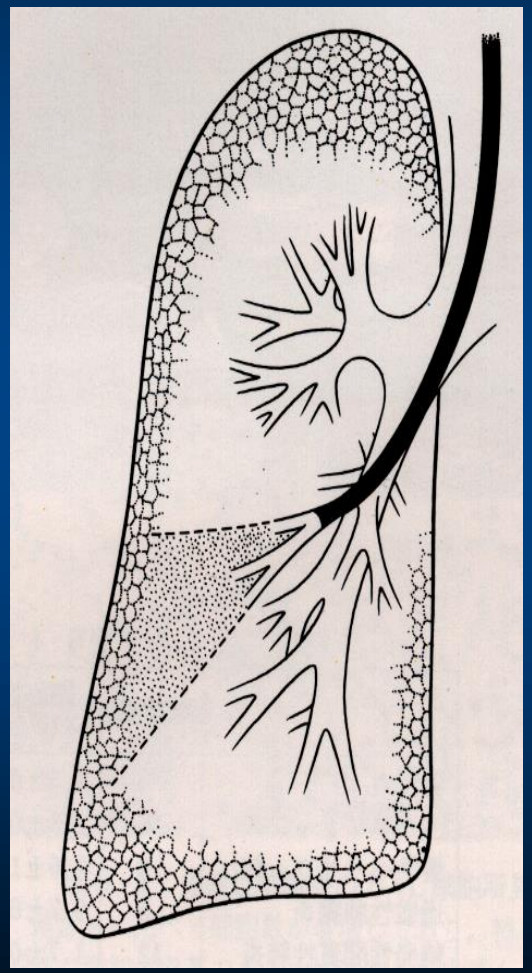
Fibrotic HP: typical HP pattern

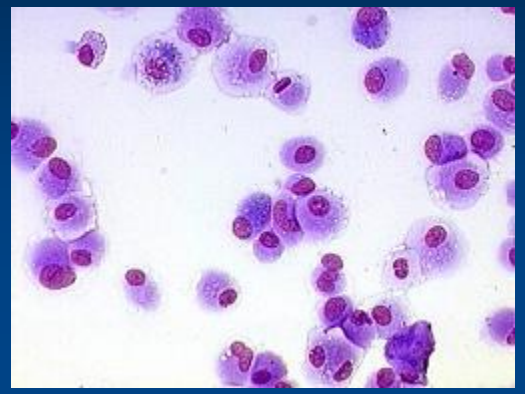
- **Diffuse** distribution, **peribronchovascular fibrosis**, mosaic attenuation (**three-density sign)**

C



Bronchoalveolar lavage





Description	결과값	단위
Others fluid Color	Colorless	
Turbidity	Mild tubid	
Specific gravity	1.020	
RBC	20	mm³
WBC	400	mm³
Lymphoctyte	79	%
Alveolar macrophage	21	%
pH - Other Fluid	5.0	

Description	결과값	단위
T-cell %	94.6	%
T helper/inducer cell %	84.4	%
T helper/inducer cell N(	-	/uL
T suppressor/cytotoxic (	6.5	%
T suppressor/cytotoxic (	-	/uL

- Unnecessary: **high pre-test** probability of HP (ACCP)

- Greatest value when **discordance** between the history and imaging lowers overall diagnostic confidence
  - **BAL lymphocyte count > 30%**

Raghu G et al. *Am J Respir Crit Care Med*. 2018;198:e44-e68

Histopathologic findings in HP

- Non-fibrotic

<u>4 key features</u>

- small airway involvement
- cellular interstitial inflammation
- lymphocytes >
- poorly formed granuloma

- Fibrotic

<u>3 key features</u>

- small airway-centered fibrosis
- fibrosing interstitial pneumonia*
- poorly formed granuloma

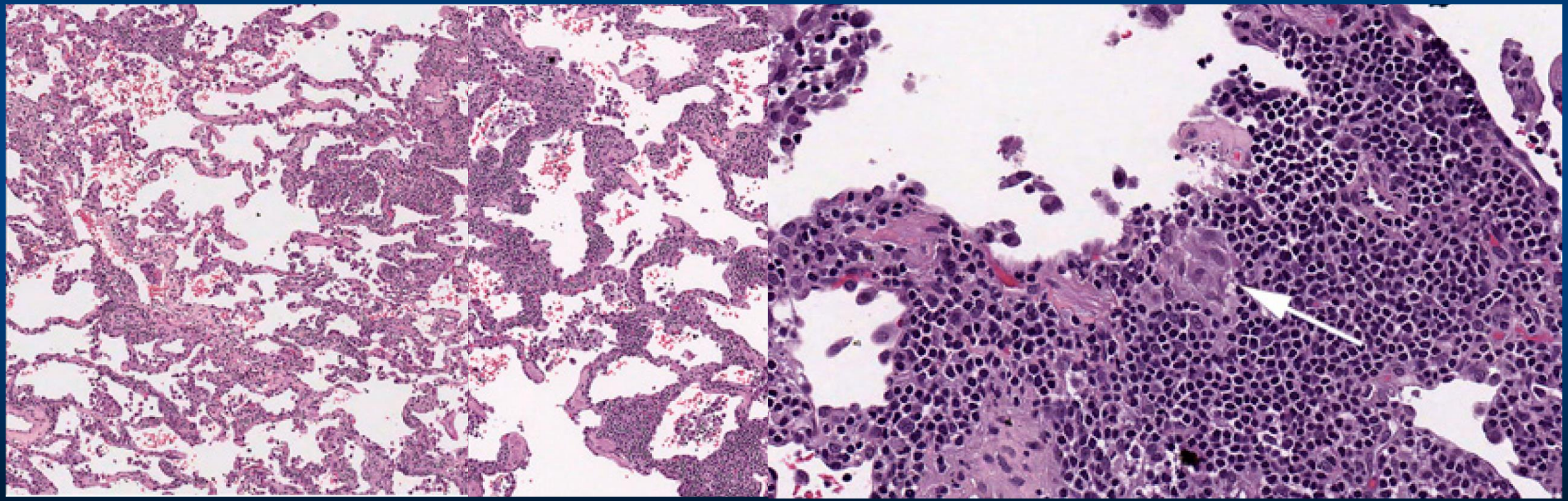
* fNSIP, UIP, indeterminate, solely peribronchiolar fibrosis

• HP, Probable HP, indeterminate for HP

Raghu G, et al. *Am J Respir Crit Care Med* 2020. 202:e36-69.

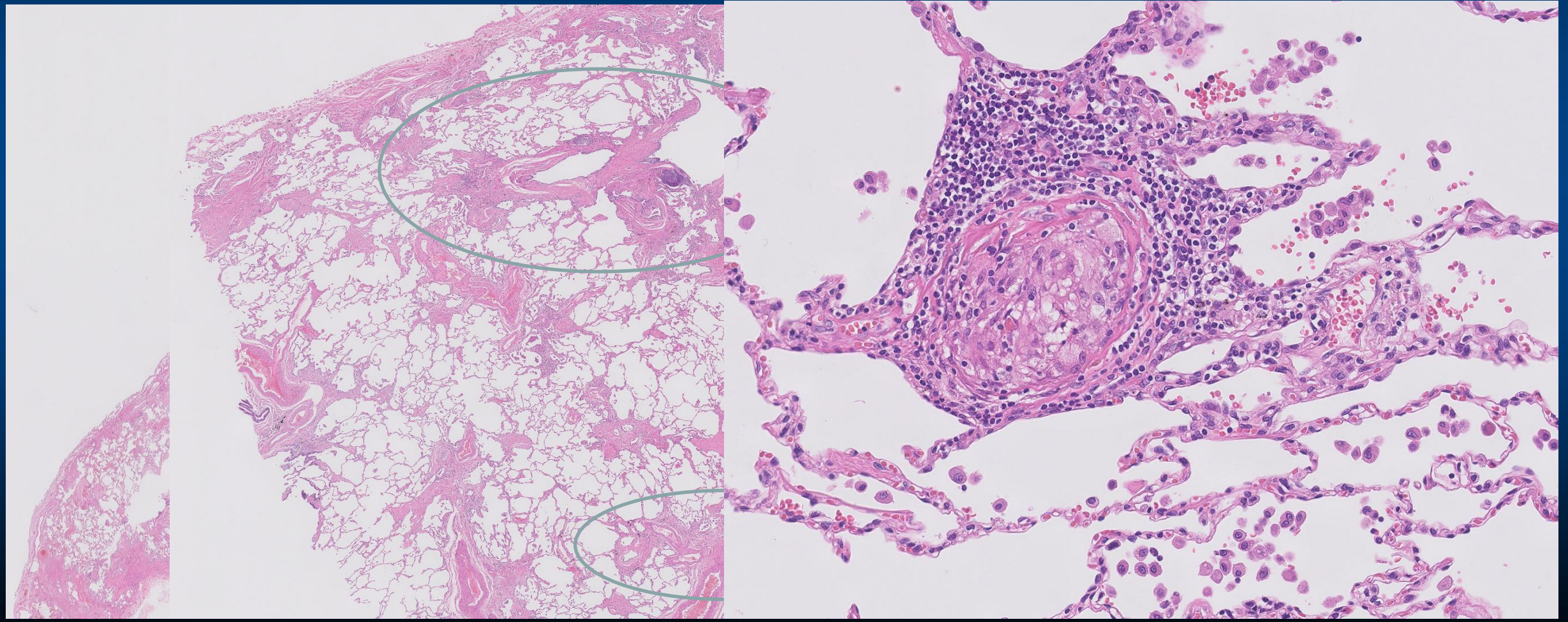
Pathologic features: non-fibrotic HP

- Cellular-IP
- Cellular bronchiolitis
- Poorly formed non-necrotizing granuloma

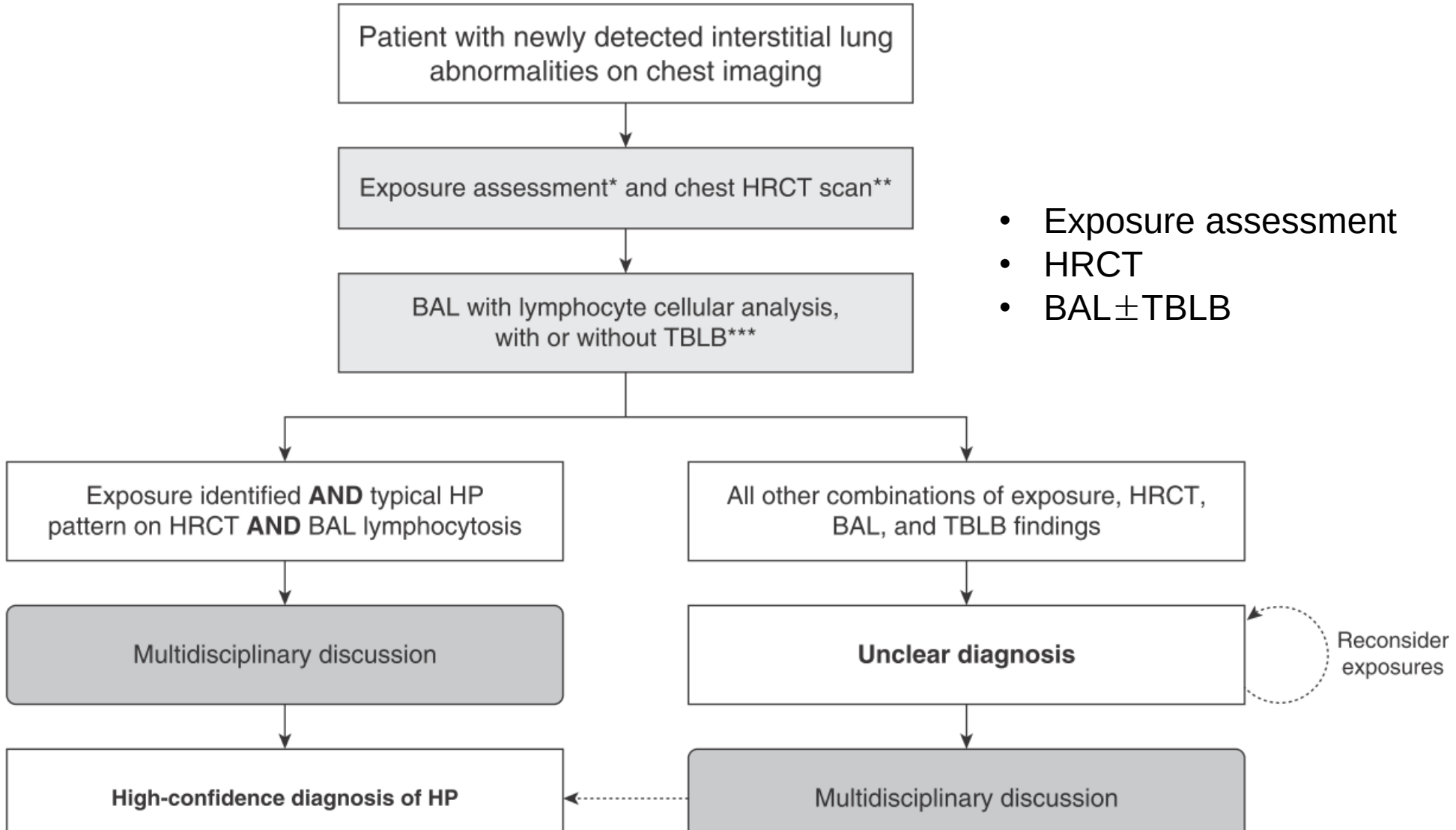


Pathologic features: fibrotic HP

- Fibrosing-IP: patchy subpleural, interstitial fibrosis; Airways centered fibrosis; Bronchiolocentric fibrosis; Fibroblastic foci; Honeycombing; Fibrosing granuloma



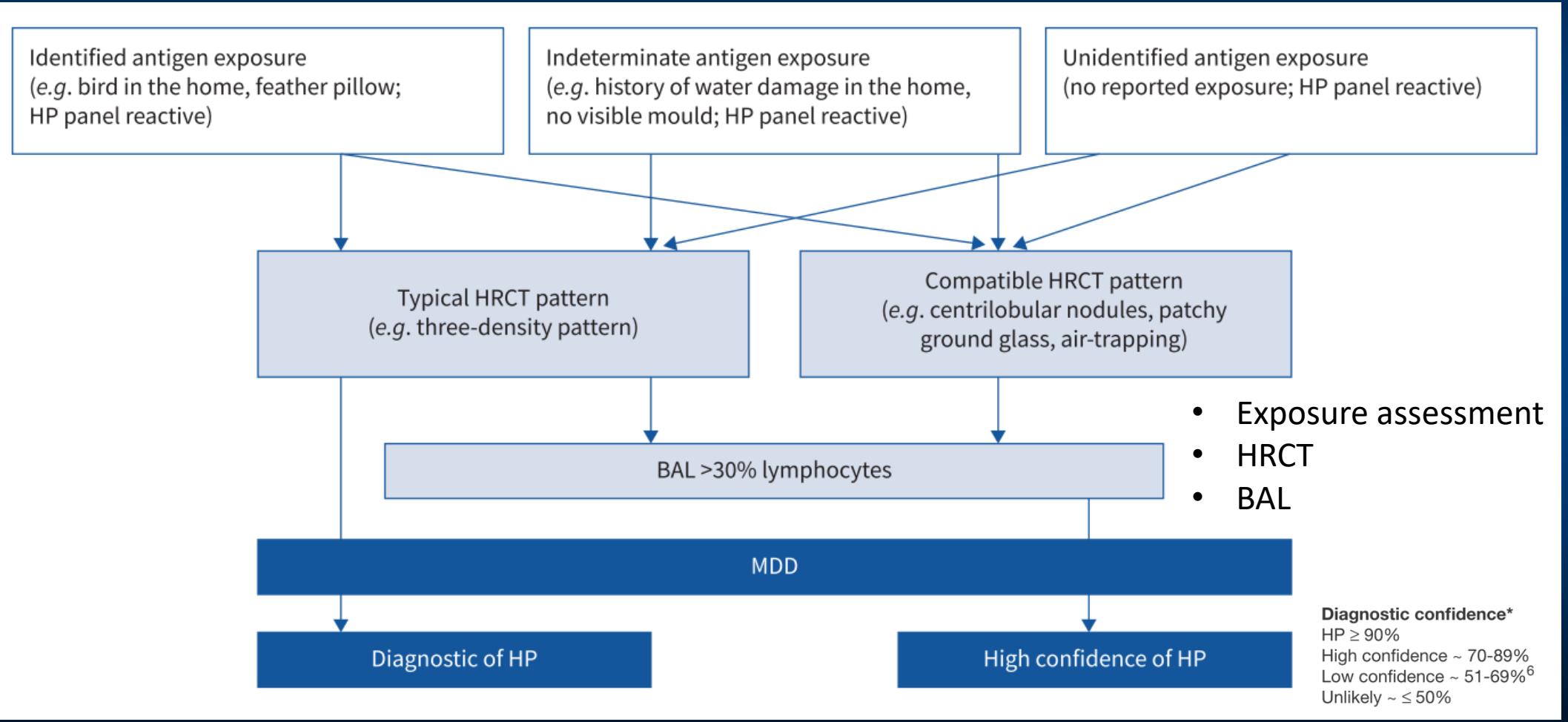
ATS/JRS/ALAT: algorithm for the diagnostic evaluation of possible HP



- Exposure assessment
- HRCT
- BAL±TBLB

pir Crit Care Med 2020. 202:e36-69.

ACCP: algorithm for the diagnostic evaluation of possible HP



- Exposure assessment
- HRCT
- BAL

Perez et al. CHEST 2021;160(2): e97-e156

HP: treatment

- Avoidance
- Corticosteroids
- Immunosuppressants
- Antifibrotics

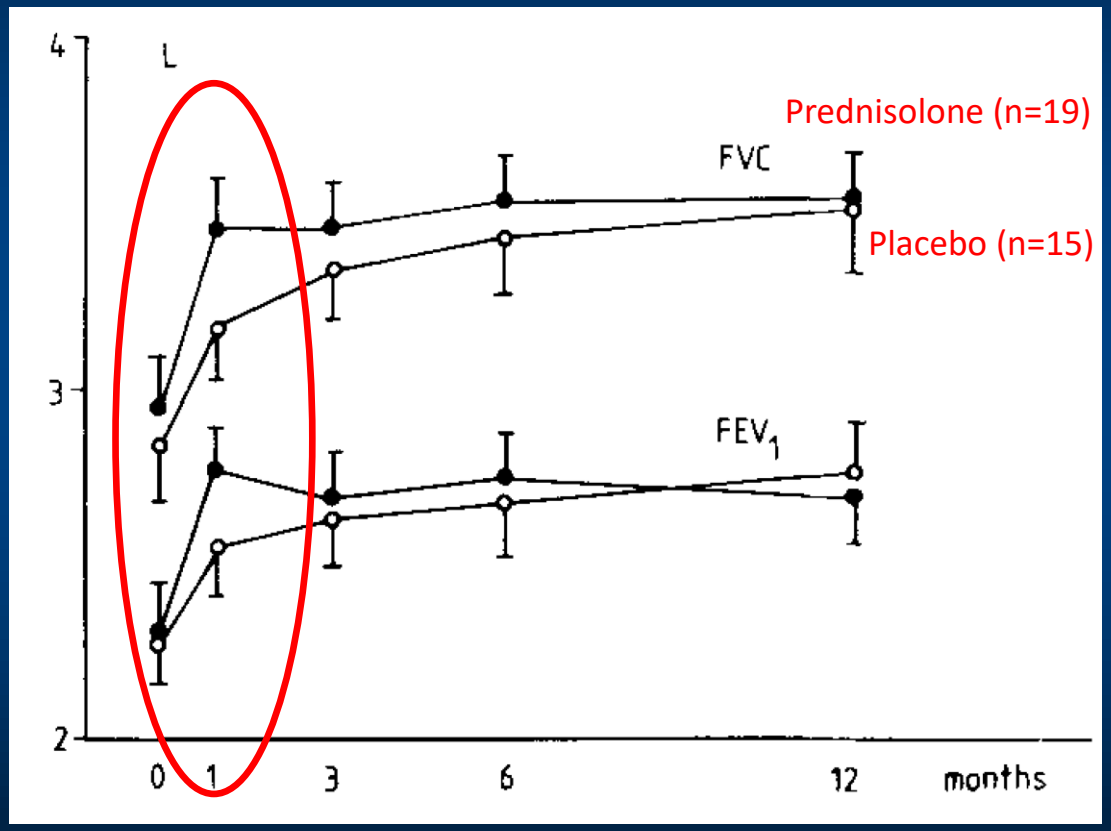
Anti-inflammatory therapy

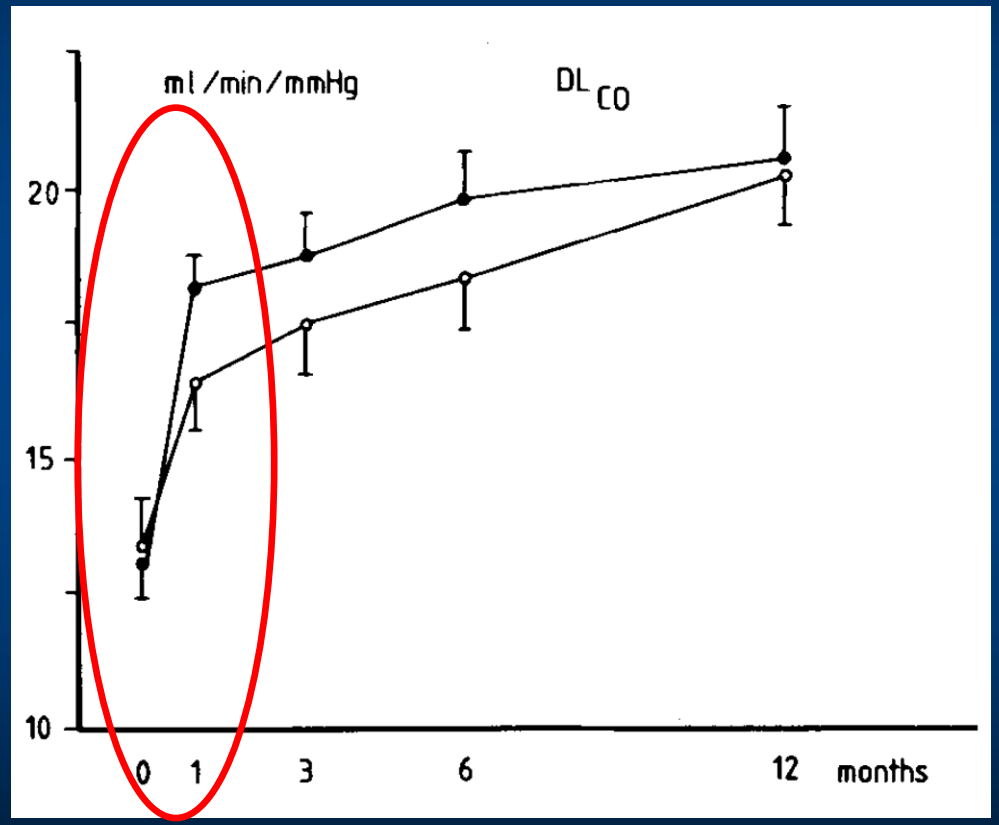
- Corticosteroid: empiric treatment scheme: 0.5-1 mg/kg day (up to 60 mg)
  - 1 to 2 weeks in non-fibrotic HP
  - 4 to 8 weeks in fibrotic HP
  - followed by a gradual taper to off or a maintenance dose of approximately 10 mg/day
  - duration: no consensus

- Immunosuppressive treatment: MMF or AZA
  - chronic progressive disease
  - complications of long term steroid therapy

Varone F, et al. *Lung* 2020 Jun;198(3):429-440.

Corticosteroid improves lung function in Farmer's lung

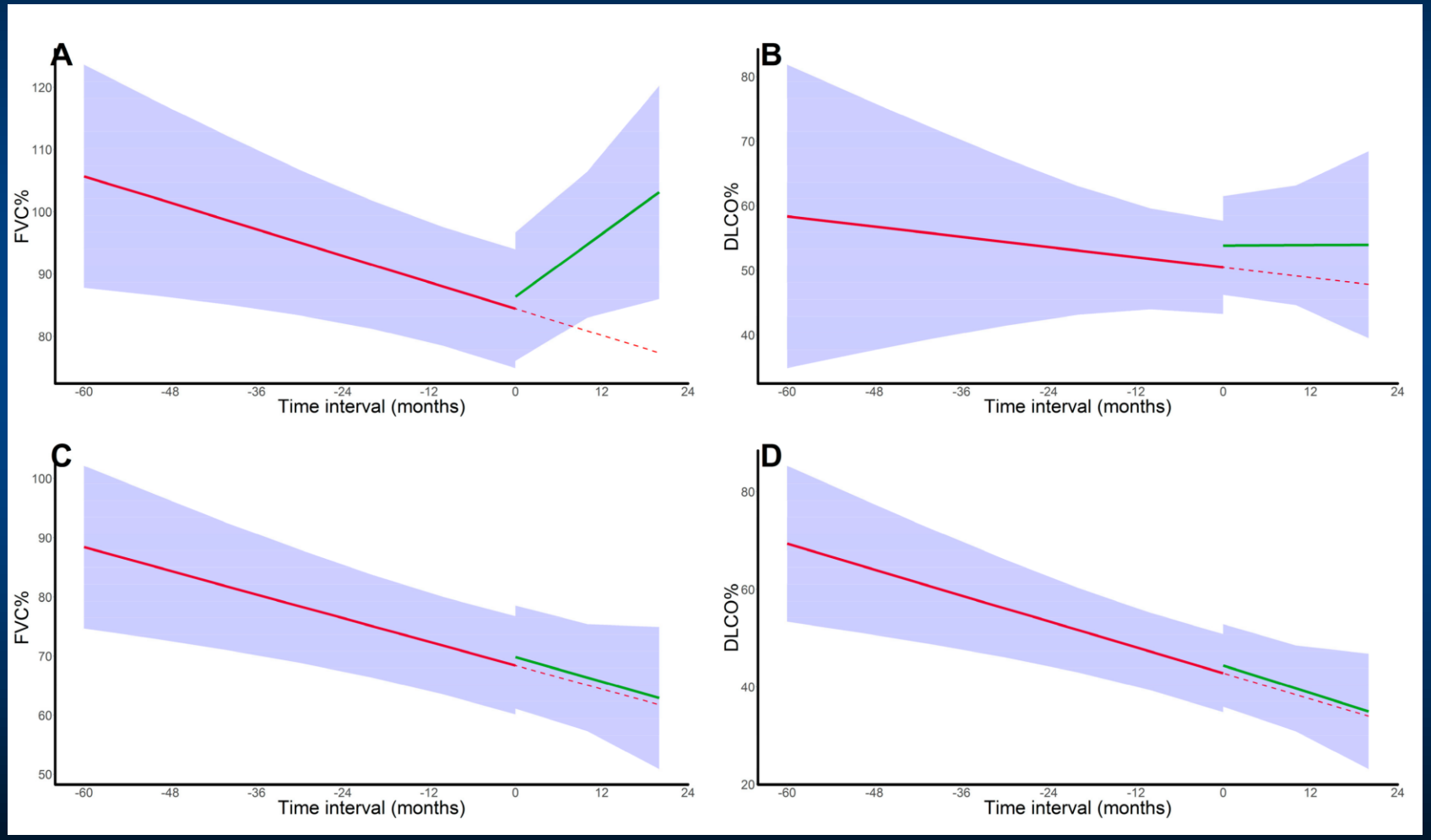




- RCT (n=36): treated with prednisolone (8weeks) or placebo; At 5 years, no differences in lung function between two groups

Kokkarinen JI et al. *Am Rev Respir* Dis 1992;145:3-5.

Effect of corticosteroid on lung function shows differences between non-fibrotic and fibrotic HP



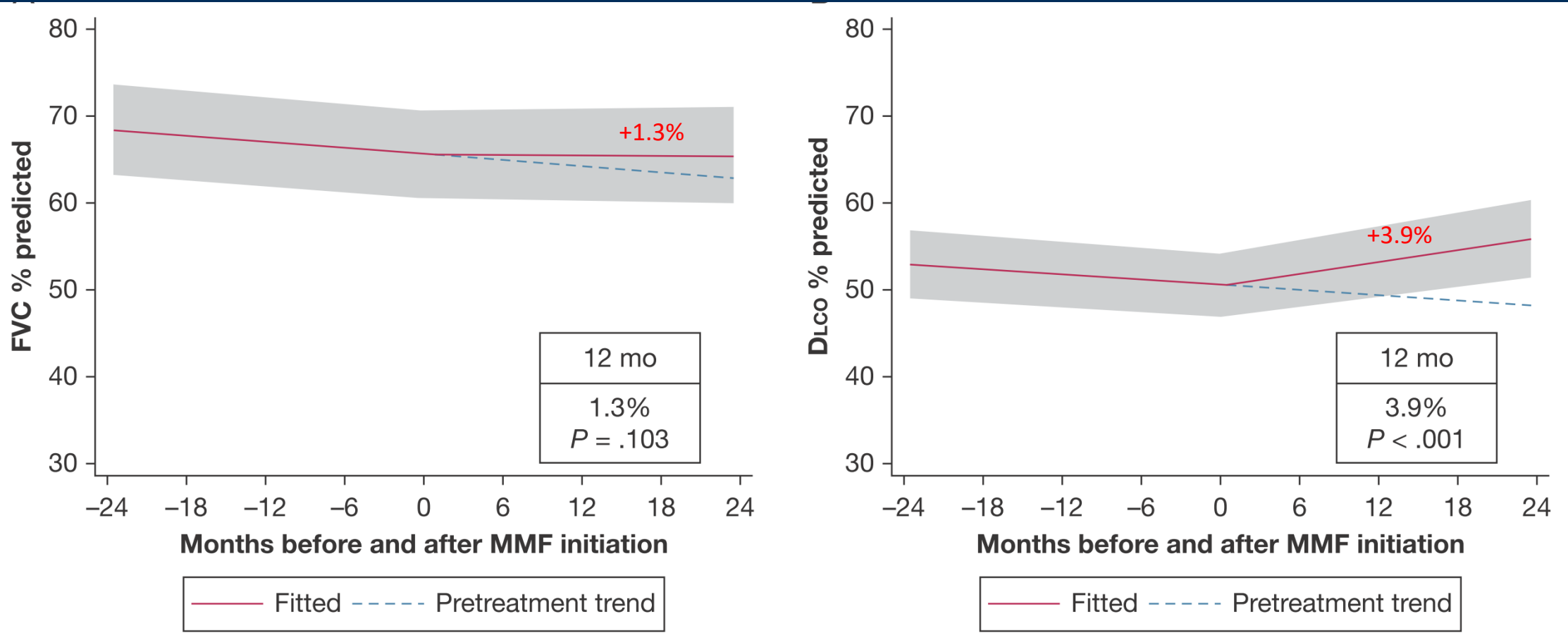
Non-fibrotic HP

Fibrotic HP

- Retrospective HP cohort (n=202; fHP in 109); the mixed effect model

Sadeleer LJ, et al. *J Clin Med* 2019;8:14

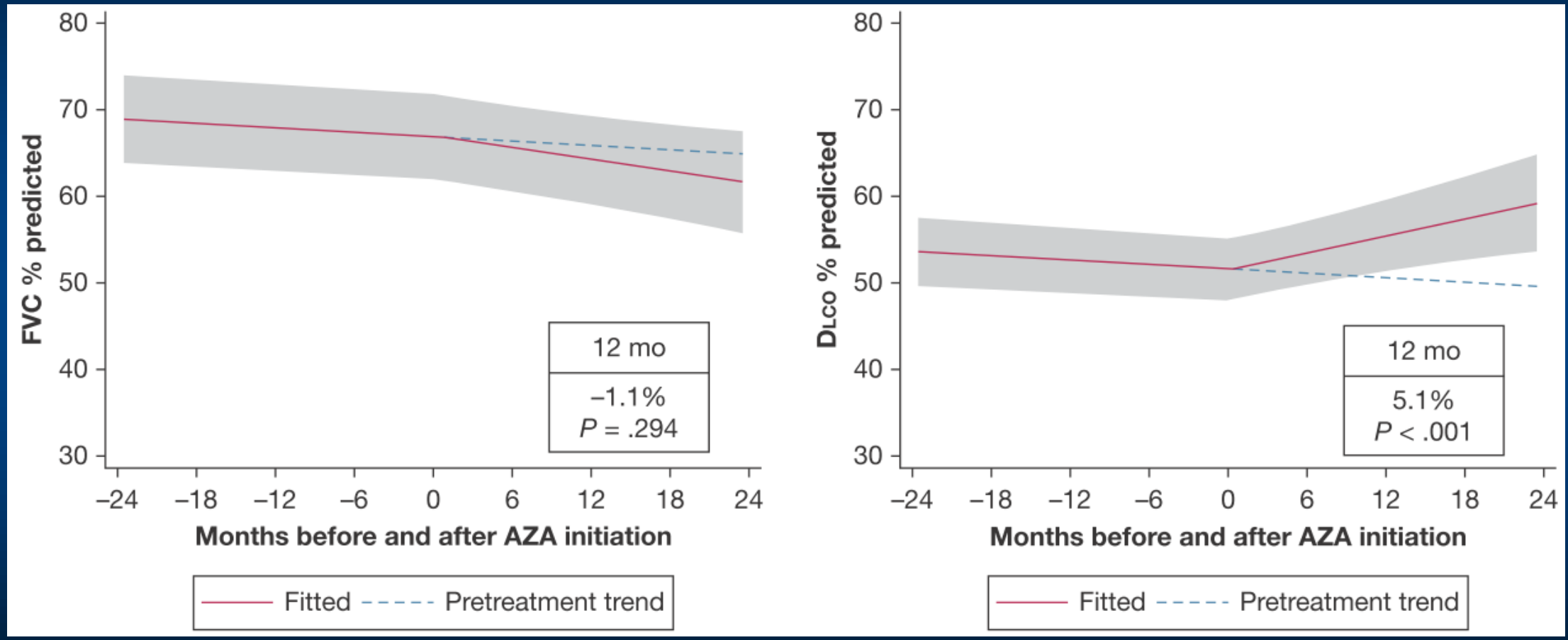
Change in lung function before and after initiation of mycophenolate



- Retrospective chronic HP cohort (n=70; MMF in 72.9%); linear mixed effect model

Morisset J, et al. *Chest* 2017;151(3):619-625.

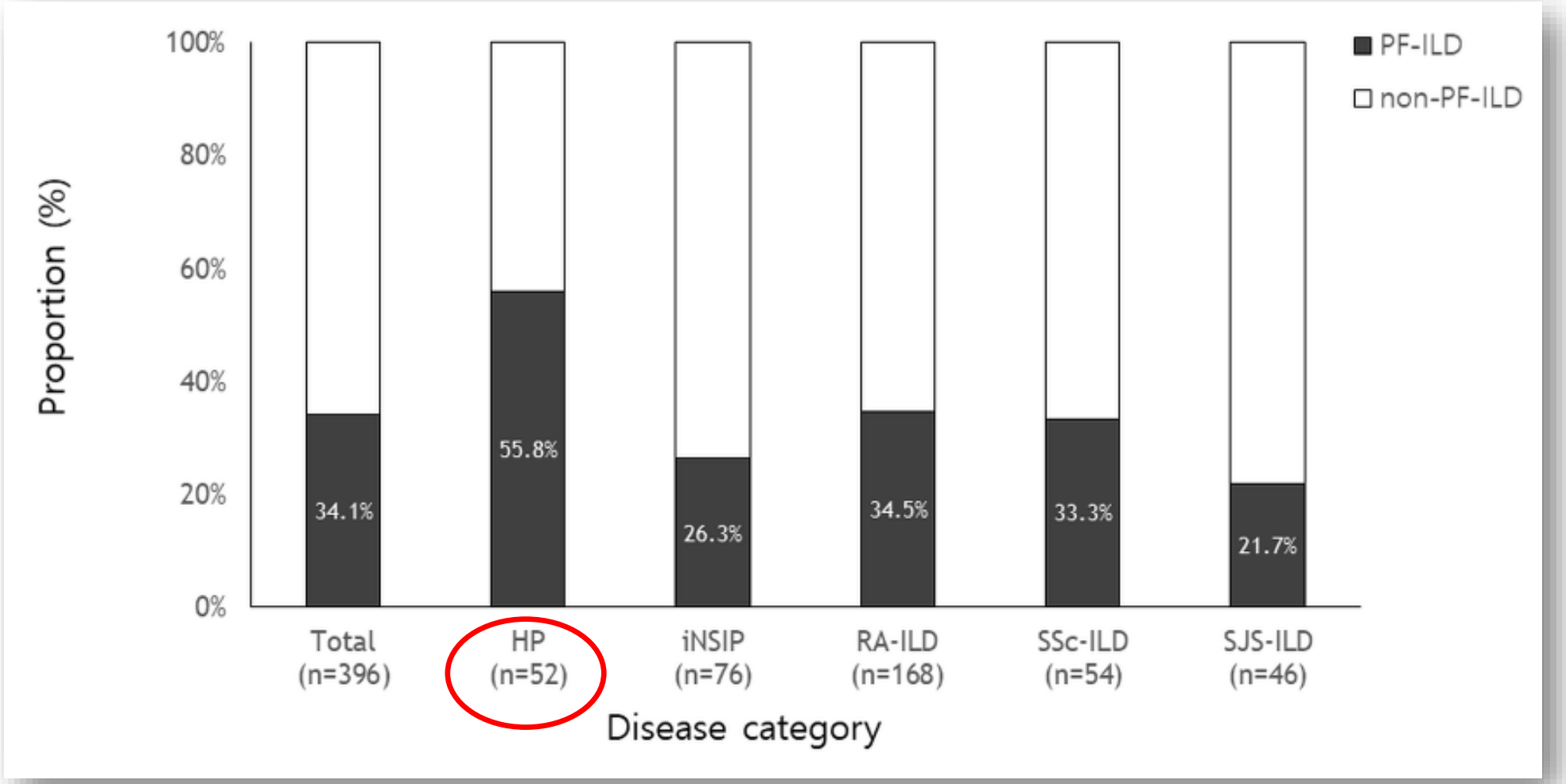
Change in lung function before and after initiation of azathioprine



- Retrospective chronic HP cohort (n=70; AZA in 27.1%); linear mixed effect model

Morisset J, et al. *Chest* 2017;151(3):619-625.

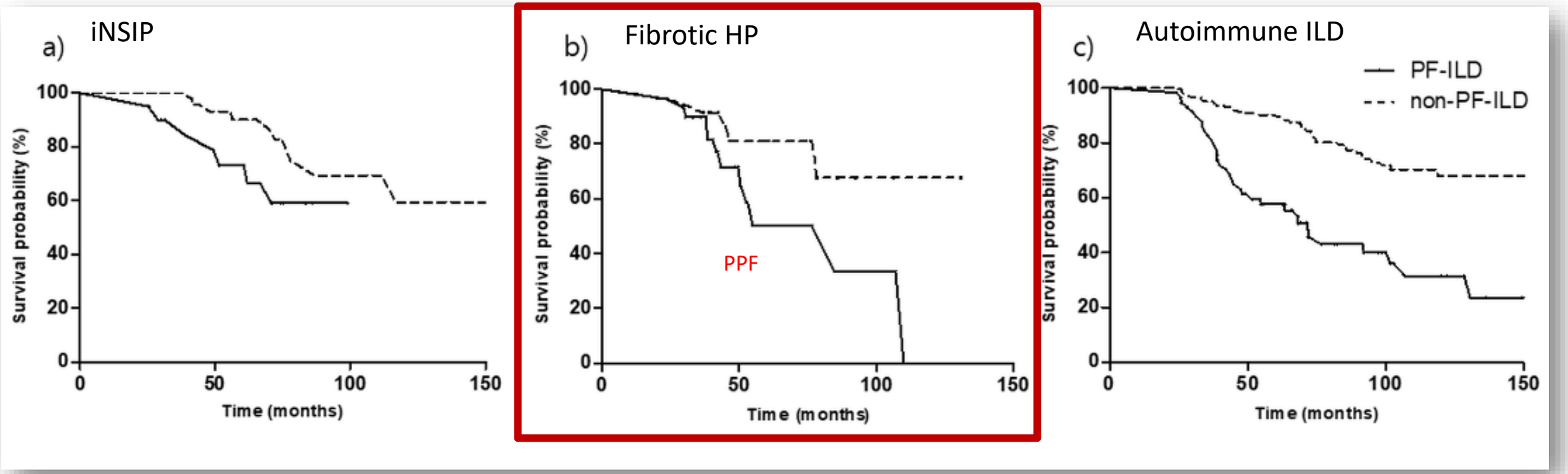
Proportion of PPF among ILD subtypes



- Retrospective non-IPF fibrosing ILD cohort more than 2 year follow-up duration (n=396); linear mixed effect model

Kwon et al. *Respiratory Research 2021;22:282*

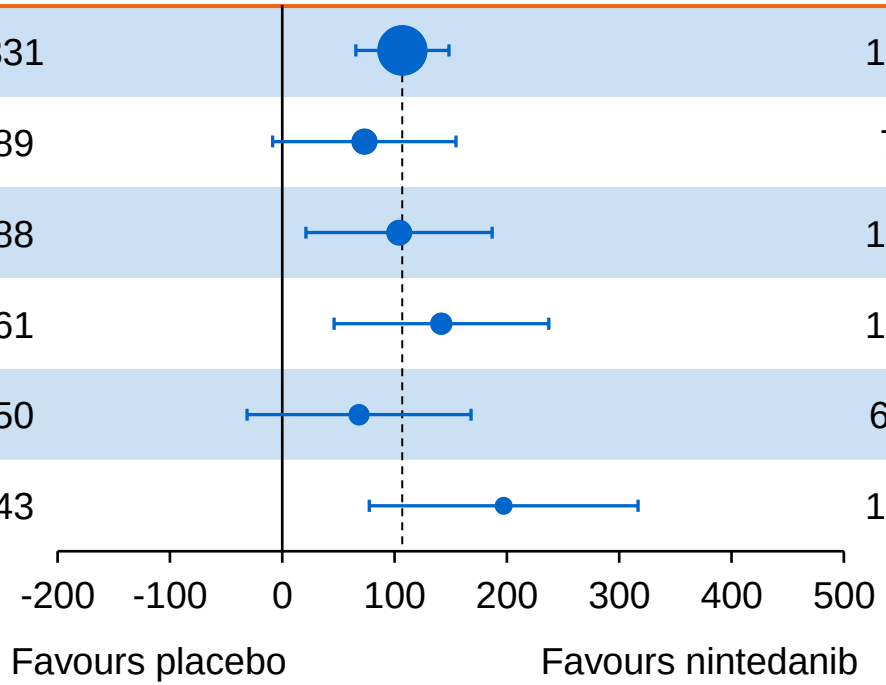
PPF: survival analysis



Kwon et al. *Respiratory Research 2021;22:282*

INBUILD: annual rate of decline in FVC (mL/year) in 5 groups by ILD diagnosis in the overall population

	N analysed		Difference in annual rate of decline in FVC (95% CI)	Treatment-by-subgroup-by-time interaction
	Nintedanib	Placebo		
All subjects	332	331	107.0 (65.4, 148.5)	p=0.41
Hypersensitivity pneumonitis	84	89	73.1 (-8.6, 154.8)	
Autoimmune ILDs	82	88	104.0 (21.1, 186.9)	
iNSIP	64	61	141.6 (46.0, 237.2)	
Unclassifiable IIP	64	50	68.3 (-31.4, 168.1)	
Other ILDs*	38	43	197.1 (77.6, 316.7)	

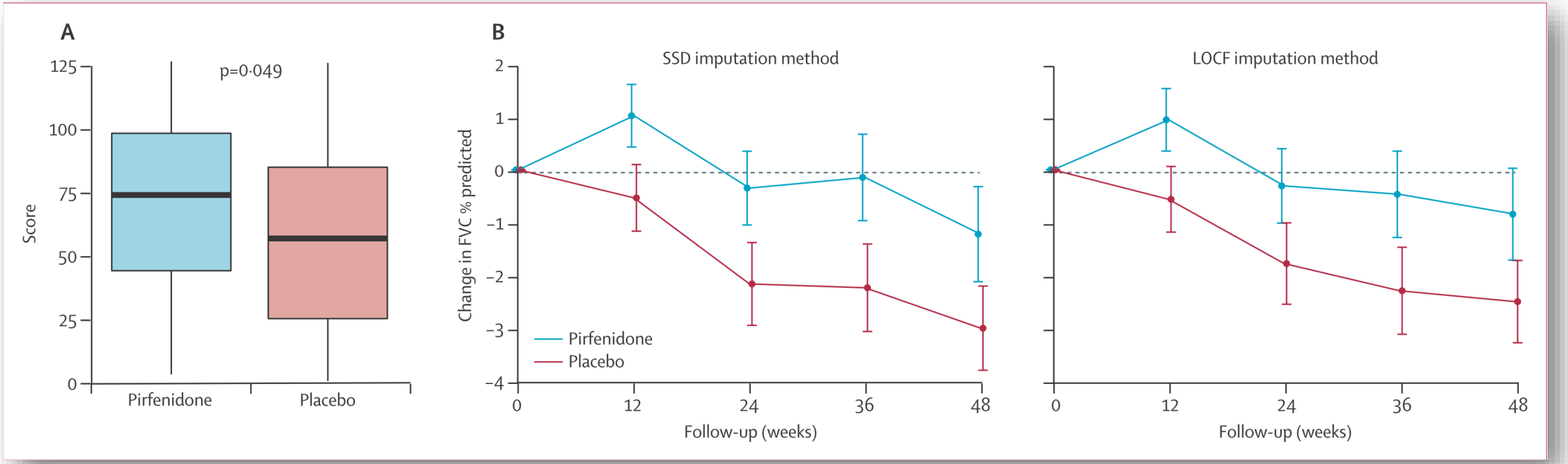


*Included sarcoidosis, exposure-related ILDs and selected other terms in “Other fibrosing ILDs” category of case report form.

- HP: 26% of enrolled patients

Wells AU, et al. *Lancet Respir Med*. 2020 May;8(5):453-460.

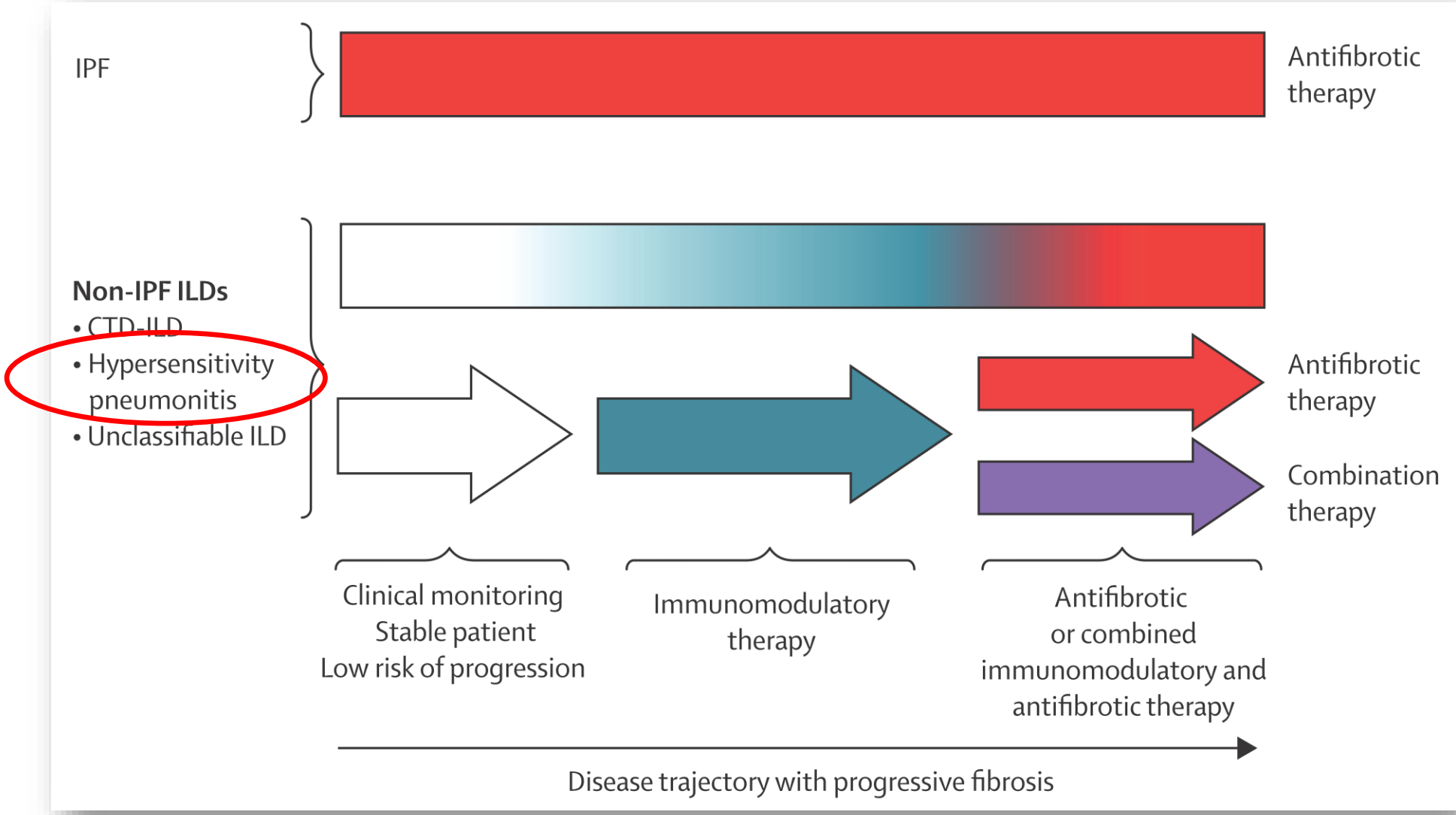
RELIEF: absolute changes in FVC and time course for mean change in FVC to week 48



- Distribution of Wilcoxon scores (M-W U test), Median difference: 1.69 FVC % pred; HP: 57 of 127 patients

Berh J et al. *Lancet Respir Med* 2021;9(5);476-86

Conceptual framework for the treatment of fibrosing ILD



Johannson et al. *Lancet* 2021;398(10309):1450-60

과민성폐렴 코호트 구축사업 (2024-2025)

- 환경성 폐질환 연구회 주도(2024 KATRD 연구회 연구비 사업)
- 대한결핵및호흡기학회 회원 참여
- Fibrotic HP 중점: 300명 이상
- 자료수집: 임상역학자료 및 혈액샘플

- 국내환자 임상특성 및 자연경과 조사
- 국내 환자 노출항원조사
- Fibrotic HP 진단을 위한 예측모델개발

Summary

- Diagnosis in HP
  - **Incorporation** of exposure assessment, imaging, BAL and histopathologic findings
  - **fibrotic** vs. nonfibrotic HP

- Management in HP
  - **Advanced, progressive, fibrosis**
  - identification and avoidance of **inciting antigens**
  - Immunomodulatory medications – 1st line
  - Antifibrotic agents – 2nd line

Diagnosis of HP requires integration of multiple domains in the context of MDTM

- Agreement between specialists on diagnostic likelihood for ILD diagnosis

	Clinicians (κw)	Radiologists (κw)	Pathologists (κw)
Idiopathic pulmonary fibrosis	0·72 (0·67–0·76)	0·60 (0·46–0·66)	0·58 (0·45–0·66)
Connective tissue disease-related interstitial lung disease	0·76 (0·70–0·78)	0·17 (0·08–0·31)	0·21 (0·06–0·36)
Non-specific interstitial pneumonia	0·31 (0·27–0·41)	0·32 (0·26–0·41)	0·30 (0·00–0·53)
Hypersensitivity pneumonitis	0·42 (0·30–0·47)	0·35 (0·29–0·43)	0·26 (0·10–0·45)

* A single center retrospective ILD cohort (n=70); MDTM=multidisciplinary team meeting; kw=weighted kappa

Walsh SF et al. *Lancet Respir Med* 2016;4:557-65

HP guidelines 2020

ATS/JRS/ALAT – *nonfibrotic* HP

Strong YES	Weak YES*	NO recommendation or suggestion
		
<u>BAL for lymphocyte cellular analysis</u>	**Serum IgG testing** **<u>TBLB</u>** **SLB**	**A questionnaire** **<u>TBLC</u>**

- 밑줄: 2023 ILD 임상진료지침

Raghu G, et al. *Am J Respir Crit Care Med* 2020. 202:e36-69, KATRD, ILD 임상진료지침 2023

HP guidelines 2020

ATS/JRS/ALAT – *fibrotic* HP

Strong YES

Weak YES*

Serum IgG testing

BAL for lymphocyte cellular analysis

TBLC

SLB

NO recommendation or suggestion

A questionnaire

TBLB

- 밑줄: 2023 ILD 임상진료지침

Raghu G, et al. *Am J Respir Crit Care Med* 2020. 202:e36-69, KATRD, ILD 임상진료지침 2023